THE IRON AGE

THURSDAY, SEPTEMBER 13, 1888.

New Horizontal Boring Mill.

The E. W. Bliss Company, of Brooklyn, N. Y., recently built for their own use a horizontal boring mill which, however, is adapted to general shop work, and may therefore be of some interest to our readers. Accordingly, we present in this issue elevations and several details illustrating the principle features of the tool. By its use holes may be bored parallel to each other in heavy work without resetting the work, and without "traveling" the latter during the process of boring, and it is so arranged that, while built especially for heavy duty, it can be used to great advantage on light work, as all hand-wheels and levers are convenient to the operator in his position on the right-hand side of the machine.

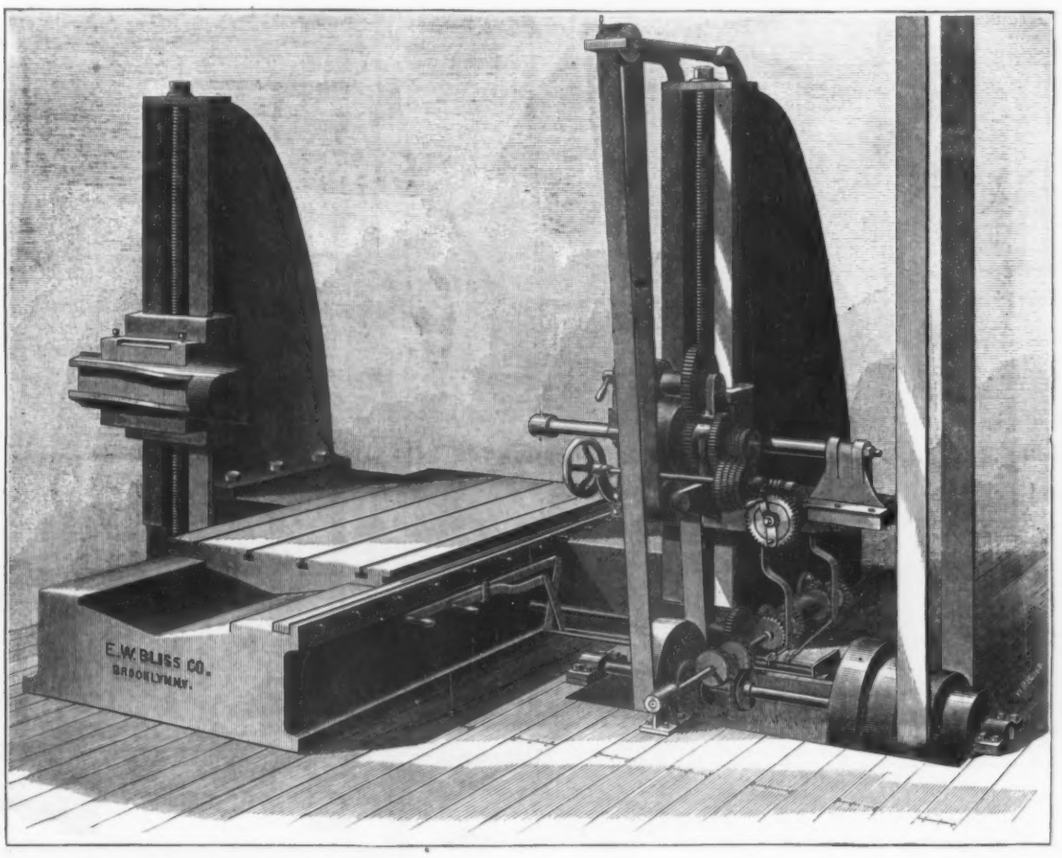


Fig. 1.—General View.

NEW HORIZONTAL BORING MILL, BUILT BY THE E. W. BLISS CO., BROOKLYN, N. Y

The table is 7 feet long by 3 feet wide, and can be "traveled" to bring the work in position by means of a rack driven by power. This is thrown in operation by the lever C (Fig. 3), and which operates a bevel wheel clutch through the intervention of the rod D. The clutch wheels are mounted on a short shaft which takes power from the driving shaft and pulley B, in the manner shown. A second bevel-wheel clutch, controlled by the lever C′, enables the operator to impart motion in either direction, through a spur-wheel attachment, to a transverse shaft E (Figs. 2 and 3). This, in turn, works the elevating screws S S, by means of which the positions of the head and tail blocks can be quickly adjusted, and in a manner similar to that used to raise or lower a planer crosshead. To compensate for any possible variation in the two vertical adjusting screws, a slight independent adjustment is provided in the tail block, so as to bring the boring-bar dead true with the bed. The driving cone pulley P is made with four steps instead of three, as shown in the details, and a heavy back gear is attached to the spindle, thus giving eight speeds for the bar. A cross-section of the spindle back gear arrangement is given in Fig. 4. The pulley A, it will be observed, is secured to a collar with a pinion M cut on its end, and capable of turning loosely on a bush on the spindle G. The gear N, on the other hand, is tightly secured to this bushing, which itself is secured to the spindle G by a groove and feather arrangement, so that while the bushing may move freely along the spindle it must impart to it its rotary motion. When running in single gear, therefore, the gear N is secured to the pulley A by the bolts shown, and partakes of its motion, transmitting it directly to the spindle G. The pinion M is not in gear with any wheel during this time. In running with the back gear, however, the bolts holding the wheels N and A together are loosened, permitting of their free and independent motion. The two upper gear-wheels shown in Fig. 2 are thrown into gear, and the motion from A and M is then carried to the larger of the upper wheels, thence to the smaller one, the two being on the same shaft, and finally down again to the wheel N and the spindle G. The driving belt, it will be noticed, is arranged in a rather striking manner, passing from the pulley B, first over the two idlers F F, then over the spindle pulley A, and thence back around B. This allows the raising and lowering of the head-block without entailing any difficulty with the belt, requiring no change of length. The spindle carrying the boring-bar is of steel, 3½ inches in diameter and has 24-inch feed lengthwise. It is carried by a head with 60 inches vertical adjustment upon a strong upright securely attached to the bed and the cutter end of the bar is supported through a bush carried by the tail-block upon a similar upright at the left of the machine. The spindle is fed forward by a rack and pinion driven by a worm gear, W W′, and so arranged that the latter may be thrown out, allowing the bar to be run back quickly by hand. This feeding device is driven through gearing from the main spindle and has four rates of feed. This detail of the arrangement is shown in Fig. 5, the feed-wheels K (Fig. 2) being loosely mounted on the feed-spindle and secured individually, as many desired, by a feather, *b*, moved along a slot in the spindle by the milled head *a*. When the feed-wheels

are out of gear the attendant may feed the spindle along by hand through the hand-wheel L (Figs. 2 and 3), which, as shown, is mounted on the feed-spindle and controls the worm W and worm-wheel W'. The end of the spindle rests in the support H, which, as noted, is furnished with a rack underneath.

The extreme width of the tool in the clear, between head and tail blocks, is 8 feet, and its weight is 26,000 pounds.

Jointing Phosphor-Bronze Wires Without Heat.

One of the greatest difficulties in connection with the use of phosphor-bronze wire, or indeed of any wire of copper alloy possessing hardness and great tensile strength, has been in the making of joints. In the ordniary manner of soldering the heat has been found to be deleterious, and even with ordinary hard-drawn copper workmen find a difficulty in making satisfactory joints. In the "Journal of the Society of Telegraph Engineers and Electricians" an abstract is given of a foreign technical journal, which describes a method for jointing phosphor-bronze wires without any application of heat, which appears of a sufficiently interesting character to deserve the attention of our readers. The abstract states: "It is very desirable to avoid by all means the heating of phosphor-bronze wires, and, consequently, some means of jointing had to be sought for to replace the method of soldering used for iron wires. Moreover, experience has shown that some local action is set up between the tin solder and the iron wires, which in time leads to a weakening of the joint; such an action would of course be still greater with phosphor-bronze wires, owing to the greater affinity of tin and copper. The best substitute for solder is a copper amalgam prepared as follows: Freshly precipitated copper oxide is heated in a tube in a stream of hydrogen until it is reduced to metallic copper. When thoroughly cooled this fine powder is moistened with dilute sulphuric acid and well mixed with mercury, and is then washed. A simpler plan, though not such a good one, is to obtain the copper powder by reducing copper sulphate by means of metallic zinc. In making use of this amalgam for jointing wires it is pressed closely round them and allowed to set. On this account a twisted joint is not very well adapted; a Britannia joint is better, as the amalgam penetrates inside the binding wire. But the best joint is made with a tube connection, the two ends of the wires being turned up at not too sharp an angle and secured with binding wire; the amalgam is then pressed well into the tube, where it sets quite hard. No details of this cold joint are given as to the points of strength and durability, which are highly material in judging of a successful joint."

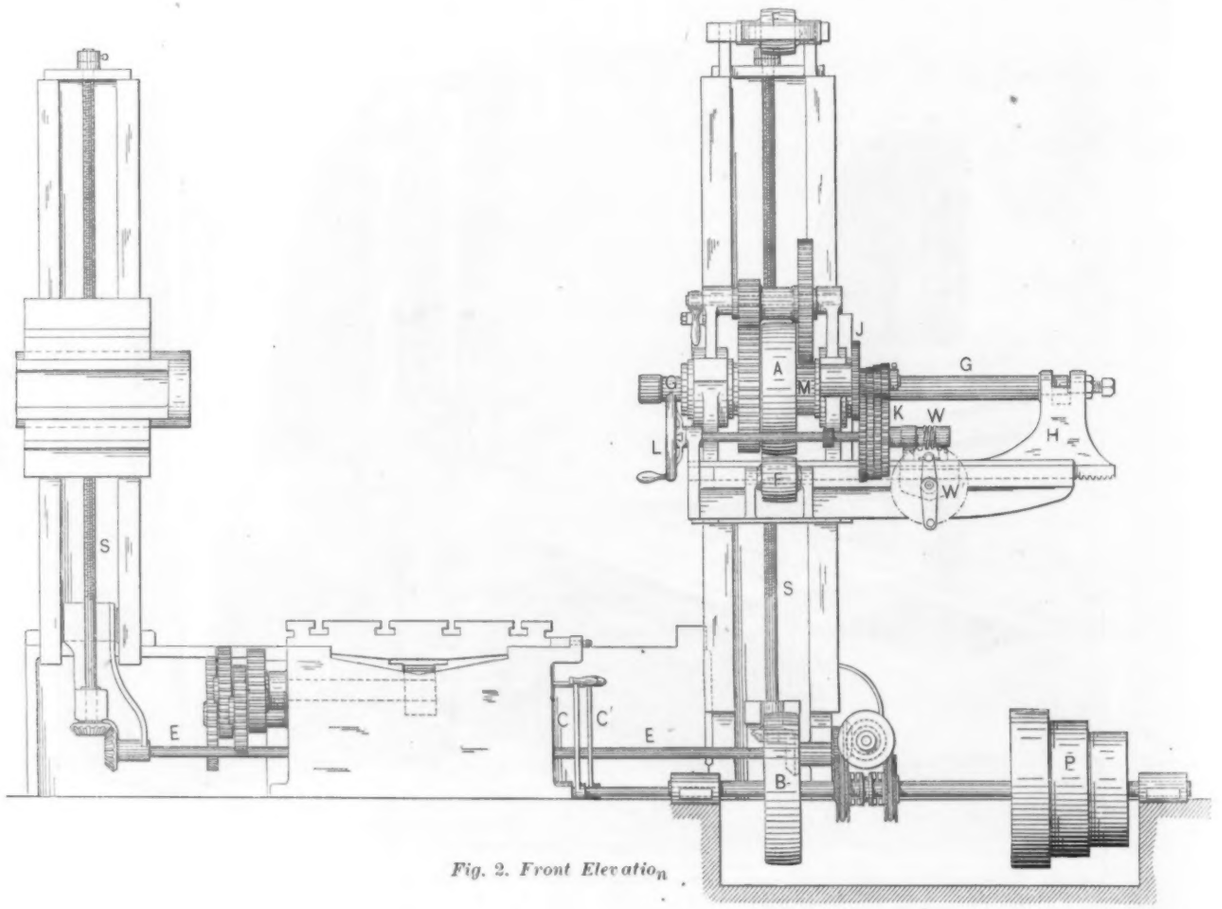


Fig. 2. Front Elevation.

NEW HORIZONTAL BORING MILL, BUILT BY THE E. W. BLISS CO., BROOKLYN, N. Y.

The Interstate Industrial Exposition at Chicago was opened on the 5th inst. with much ceremony and in the presence of a very large attendance. The exhibits are unusually varied, showing that the public have not lost their interest in this annual display of the mechanical progress of the Northwest. The managers of the exposition look forward to a more successful season than ever, and they have put forth every effort to make the great building on the lake front attractive. The rival exposition at Milwaukee opened at the same time, and intends to contest with the Chicago exposition for the honor of having the best display of exhibits. According to the Milwaukee newspapers the local manufacturers and business men have entered with great spirit upon the work of making a creditable showing for their city, and the exhibits are greatly praised for their variety and attractiveness. St. Louis also entered the lists on that day with its great industrial exposition, which has always won honors, and will surely not be found lagging in the rear this year. The St. Louis exposition is only one of a series of attractions gotten up every autumn by the residents of that city in order to call the attention of strangers to their business advantages and capabilities. The autumnal festivities of previous years are remembered with much pleasure by those who participated in them, and those who can will indulge in the repetition of a visit to St. Louis this season, especially when the crowning attraction, "the Veiled Prophets," present their pomp and pageantry.

Westinghouse, Church, Kerr & Co., are issuing from their Chicago office, 156 and 158 Lake street, a neat little pamphlet, descriptive of their Westinghouse automatic and junior Westinghouse automatic engines. A unique feature of the pamphlet consists in its being a "double ender." Half of the contents being devoted to each engine; they are printed the reverse of each other, so that whichever way the pamphlet is opened the first half is "right side up," while the last half is "upside down." This is done to attract the attention of the reader to both engines. The special features of the engines are compactly but very clearly stated.

Work on the Navy.

While the good work of building new vessels of war progresses, the old wooden ships are not being entirely neglected. According to the *Army and Navy Journal*, considerable work is being done at the various yards in the way of rebuilding and repairing a number of these now old but still useful craft. At the Portsmouth, N. H., yard the Kearsarge is being extensively repaired, and will be ready for her officers October 1. The estimated cost of the repairs to this ship will be $47,792.26. At the same yard the training ships Saratoga and Portsmouth will be entirely rebuilt, at an estimated cost of $68,000, and will be ready about the first of the year. At the New York yard the Richmond is fitting out, ultimately to be the flagship of the Asiatic station, and will cost, when completed, $20,596.94. She will be ready for sea in about two months from the present time.

At the Norfolk yard the Pensacola, which will be the flagship of the North Atlantic squadron, is being repaired, and the estimated cost to complete her entire is $27,311. She will be ready in about five months. This ship will receive an entire new set of boilers, which are now being forwarded from the Washington Navy Yard, where they have been in store for some time. The double-turreted monitor Puritan will shortly be sent to the yard to be rebuilt, in accordance with an act of Congress approved August 3, 1886. The training ship Jamestown will also be repaired at this yard, at an estimated cost of $12,000, and be ready in about three months. At the Mare Island yard the greatest amount of work is being done. The Iroquois is nearly ready, and her estimated cost, when finished, will be $29,400. She will be ready for sea September 15. The steamship Monongahela is also being overhauled and repaired at this station, at an estimated cost of $25,000. She will be sent again to the South Pacific as storeship of the station, with headquarters at Payta, Peru. She will be ready October 1.

The surveying steamer Ranger is being fitted for one year's service on the Pacific Coast at an outlay of $9200, and is now ready to proceed with her work. The Mohican is now in the dry dock, and after some slight repairs are put on to enable the ship to leave the dock, she will be repaired at an estimated cost of $14,800, and be ready in 60 days. The Vandalia and Adams, of the Pacific squadron, are now on their way to the Mare Island yard for repairs, and it is expected both ships will be there by the middle of October. The double-turreted monitor Monadnock is being rebuilt also at the California yard, at an estimated cost of $600,000, and will be ready in about two years.

A Large Natural Gas Well.—What is claimed to be the largest natural gas well in Allegheny County was struck a few days since on the farm of John M. Allison, in Richland township, and just about a mile southeast of Bakerstown. It is said to be fully equal to the McGugan well in Washington County, or the largest of the Murraysville wells. It has not yet been lighted or piped, and its roaring can be heard for eight or ten miles. A blue column of gas extends about 15 feet above the mouth of the well, and early in the morning can be traced to the top of the derrick. The gas was struck at the depth of 1600 feet. J. Willison, of Warren, Pa., is the lessee, and it is understood that he is negotiating for its sale.

A High Bridge.—The Keystone Bridge Company, of Pittsburgh, have received a contract to erect at St. Paul, Minn., a bridge which, it is said, will be one of the highest in the world. It will extend from the end of the bridge, spanning the Mississippi River at St. Paul, across a flat to the top of a high bluff. There will be about 20 spans, four of which will be 250 feet each in length, one about 170 feet, and the remainder from 40 to 90 feet. The ends of the spans will be supported on trestle bents, some of them being 150 feet in hight. The bridge is to be of iron and steel, and the work will be especially heavy, as some of the pieces weigh many tons. The above firm have also received the contract for erecting the new Polk street viaduct and approach in Chicago. This structure will also be of iron and steel, and will be rather ornamental in design.

The Tudor Iron Works, of St. Louis, have issued a handsome catalogue of their manufactures, including rail joints, spikes, track bolts, square and hexagon nuts, two and four-bolt joints, light tee-rails, tram-rails, screw-bars, drift-bolts, bridge bolts, switches and frogs. A few useful tables, and a cipher for ordering goods are added.

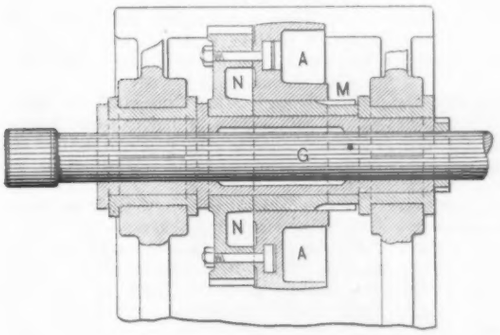


Fig. 4.—Section of Back Gear.

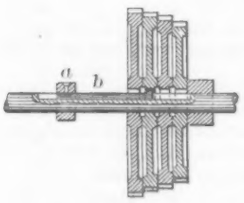


Fig. 5.—Section of Feed Gears.

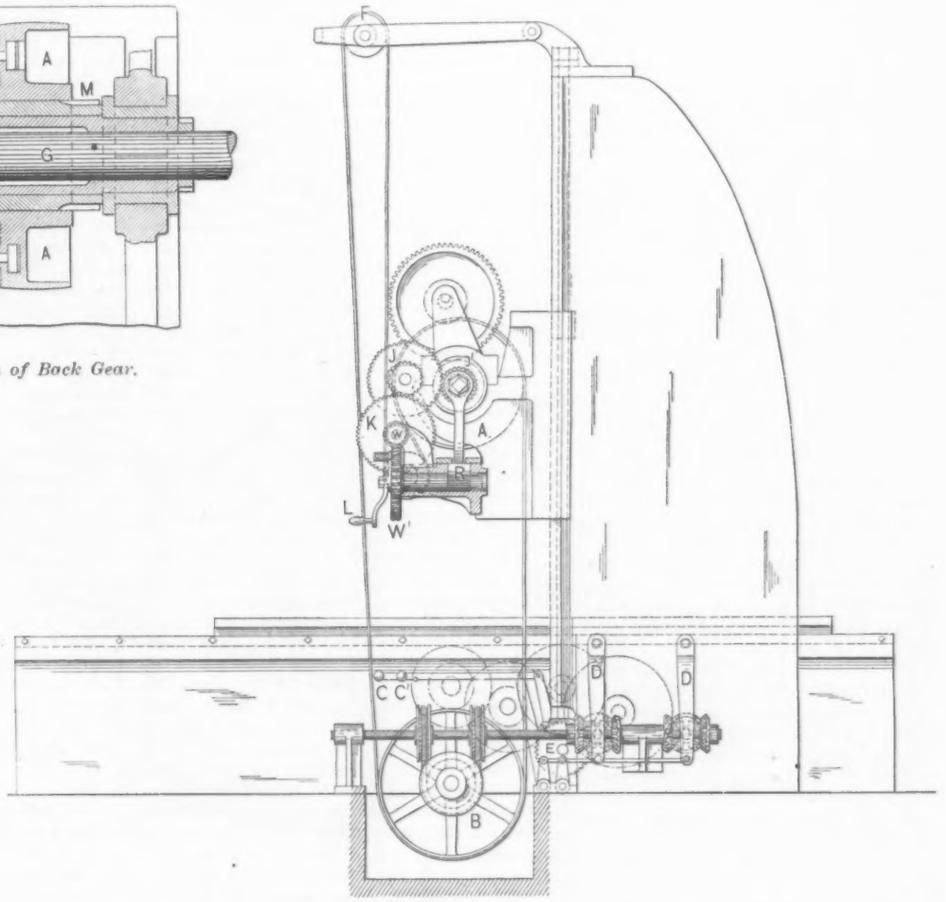


Fig. 3.—Side Elevation.

NEW HORIZONTAL BORING MILL, BUILT BY THE E. W. BLISS CO., BROOKLYN, N. Y.

The Buffalo Fair.

Too much cannot be said in praise of Cicero I. Hamblin and the men associated with him who have brought about the formation of the Buffalo International Fair Association. From the start they have given their money, time and skill to further its interests. They are about to reap the harvest of their unselfish labor, for the success of the fair is now assured.

The fair building is one of the finest for the purpose ever put up, and is alike creditable to Marling & Burdette, architects, and to the association. Not a dark corner is to be found in the entire building. All space is equally advantageous for the display of exhibits. The galleries from which the main floor can be viewed are wide enough to accommodate any reasonable number of visitors. Evidently the projectors have faith in their venture, for it is intended as a permanent affair, and, under their management, is likely to be as prosperous in the future as it gives promise to be now. Every facility for transacting business will be given on the grounds, including post office, railroad ticket office, telegraph and express office. Every possible means of transportation, both for passengers as well as exhibits, have been made, tracks having been laid up to the grounds.

The advantages to manufacturers resulting from a participation in this fair have been recognized. Judging from the interest shown by manufacturers in neighboring and distant States, and by the reduced railroad rates to and from Buffalo, there will be several million of visitors in the city from September 4th to 14th. It has been planned to have everything go off with vim and snap so that as much will be accomplished in two weeks at this fair as is usually done at others in one month. Enterprise is contagious, and all exhibitors will realize that a rush at once is much preferable to a long drawn-out and sleepy month of labored pleasure. All the trades will contribute to the exhibit, in many instances manufacturing operations will be carried on in the building. The local manufacturers are rivaling one another in their efforts to gain recognition for their goods, and those out of the immediate vicinity are no less concerned.

The proximity of Hamilton, Toronto and London, Ont., enables Canadian manufacturers to exhibit. This will naturally draw on thousands of Canadians. The largeness with which all arrangements are being made impresses itself on one. The Buffalo *Express*, one of the enterprising papers of this part of the country has taken 3000 square feet of space to show the entire process of making a newspaper, of which two editions will be published in the building daily. The minutest operations will be performed in full view of all who care to interest themselves in the mysteries of a laily paper.

The Machinery Exhibits.

Messrs. E. Hampson & Co., of Cortlandt street, New York, show their Eclipse Corliss engine, and are running one-half of Machinery Hall with it.

The John T. Noye Mfg. Company, Buffalo, show their Rice Automatic high speed engine. The 100 horse-power engine running one-half the machinery occupies a floor space of 6 feet in width, and 16 feet in length. If you do not look directly at its 200 revolutions per minute you would not become aware that it was in motion, for no sound of jar or steam reaches the ear so perfectly does it control itself. It is a finished piece of modern engine building, and is attracting well-merited attention from all who enter the building.

The Erie City Iron Works exhibit their Automatic high-speed engine. Among gas engines the Otto and Baldwin are struggling for the supremacy. The latter is doing very effective work running the United States Company's dynamo, which furnishes light for the immediate vicinity. The Otto engine is in the same well-known form with a few new features. Users of small power are showing great interest in both these engines.

The manifold application of electricity in an almost unlimited number of ways is proved by what is shown here. The Electric Service Company, of Buffalo, have an exhibit of the Johnson Temperature Regulator. This combination of electricity and compressed air, described in *The Iron Age* some time ago, is automatic in operation, and secures an absolutely even degree of temperature wherever applied. It is now in successful operation in dwellings, office buildings, schools, libraries, &c., and proves its value daily during the trying winter weather of this latitude.

Another electrical device shown is the Electrical Accumulator, in the exhibit of the Electro-Dynamic Company, of Philadelphia. By the use of this simple invention electricity for lighting and power purposes may be stored up and held on tap, so to speak. In many factories and even in large central lighting plants these batteries have done good service. They may be charged during the day while the machinery is running, and in use at night for lighting when the power is shut off.

The Electric Power Controller Company, of 34 Dey street, New York, show an automatic device, by the use of which power pumps and all moving machinery can be controlled from a distance. The simple device is arranged to trip valves and levers, whereby machinery may be stopped in case of an accident by pushing the common electric button. The value of this invention will be appreciated by all mill owners, where many operatives are employed about the machinery, and where the liability to accident is great.

Messrs. Pratt & Letchworth, of Buffalo, exhibit a full line of saddlery and coach hardware, all of which has been taken directly from their stock. Their extensive works are located at Black Rock, from where they supply the market with buckles, trimmings, hames and carriage irons in all forms. A pair of hames, weighing 200 pounds, are shown, but no definite information could be obtained as to the kind of animal they were made for. The specimens of gray and malleable iron are very fine in finish, the latter showing a remarkable toughness, some specimens having been twisted and beaten into shapes that would be a test for lead. The brass, bronze, nickel and silver plating shown is beautiful. There are pieces of steel castings made by this firm varying in weight from half an ounce to 3462 pounds. Their capacity for heavy steel castings is 5 tons. All work shown is made in their own works, even the paper boxes in which some of the smaller pieces are packed.

The Buffalo Scale Company, of Buffalo, have a very creditable display of scales. Among the new things they show is a latch attachment, which obviates the weighing of the scoop on grocers' scales. Their oil scale is also a novelty. A cheese factory scale is shown, having seven beams. An immense can is placed on the platform, and as the milk is poured into this can the first beam weighs it, and so on until seven separate weighings have been made for as many different farmers. A suspension butchers' scale is shown, and also a scale for weighing and measuring the hight of an ambitious lean man and the hopeful fat man. Their patent testing machine for iron tests the strength of 1 inch iron bars. It registers the elastic limit and breaking strain.

The Burdict bolt forging machine, made by Plumb, Burdict & Barnard, of Buffalo, is a new bolt-heading machine, especially adapted to head square and hexagonal bolts, but equally suitable for special shapes. The machine will turn out from 2000 to 6000 bolts in ten hours, and prevent the bolt from being smaller under the head, where the clamps hold it in ordinary machines. The machines are quickly adjusted, require little power and can head bolts of any length.

H. W. Dopp & Son, Buffalo, show butcher and soap-makers' machinery.

In the exhibit of Gerhard Lang, of lager beer brewing fame, is the Goulding bottle washer. This little machine washes 60 dozen bottles an hour, or about as fast as a man can handle them. It looks as if the days of washing bottles with shot were past. Yawman & Erbe, of Rochester, are the makers of the machine.

The Niagara Stamping and Tool Company, of Buffalo, make a good exhibit of sheet-metal workers' tools, including presses, shears, &c.

The Dodge Mfg. Company, of Mishawaka, Ind., show a large assortment of sectional wooden pulleys, both for belt and friction. Much of the machinery is run by them.

Wurtz & Schmahl show their malleable iron frame elevator buckets.

David Bell, of Buffalo, a pioneer iron boat builder in that section, shows numerous models of boats built by him, and three steam hammers of novel build.

The Star Machine Company exhibit their blowers.

John E. Smith & Co., of Buffalo, show meat chopping machinery of an improved pattern.

Maischloss Bros. make a fine display of files and their file cutting machines.

Felthousen & Sherwood show injectors, ejectors and engineers' supplies.

The Cutler Mfg. Company, of Rochester, show their mailing system for large buildings, whereby letters in the upper stories of our large office buildings can be mailed with as much ease and certainty as on the ground floor.

L. & I. J. White, of Buffalo, exhibit a full line of edge tools and machine knives. Their assortment includes tools for coopers, carpenters, butchers, &c., as well as for molding and planing machinery.

The Buffalo Lock Mfg. Company show a large line of locks, hinges and door fittings.

The Buffalo Belting Works have in use on the two 100 horse-power engines their belts as well as on the engines running the dynamos of the Brush and Thompson-Houston companies. These belts are made practically endless and so secure a good bearing surface at all points when in contact with wheel. They are made in any width up to 30 inches and can be made larger if required. The company also make washers from strips of leather at the rate of 60,000 per day.

Hodge, Howell & Co., of Buffalo, exhibit their Cockle machine, which is much liked by millers throughout the country. Frank & Co., Buffalo, exhibit woodworking machinery. The most marked piece is a combination hand and jig saw.

Bradley & Co., of Syracuse, show some fine cushioned trip hammers. They are fine specimens of mechanical skill.

The Springfield Glue and Emery Wheel Company show a full line of their grinding machinery, including their automatic knife grinder.

The Shepherd Hardware Company, of Buffalo, show their lightning ice-cream freezer Queen City, fruit and wine presses, toy bank and a large assortment of builders' hardware.

Messrs. John C. Jewitt & Co., exhibit their refrigerators, water coolers and a large line of metal goods in plain brass and plated. All show a high appreciation of what is novel and artistic in coal-hods, bird-cages, teapots, cuspadores, &c.

Danforth & Clark show a fine line of gas appliances in ranges, water heaters, &c. Their line of steam and hot-water heating apparatus is also well represented.

The bicycle exhibit is very large, possibly owing to the races in connection with the fair.

Mr. Read & Son, of Boston, show their specialty, the New Mail. Mr. Will S. Atwell has the exhibit in charge. The special features they call attention to are the Trigwell ball head and the Warwick perfection backbone and rim, all of which have now a well-deserved reputation among wheelmen.

The Overman Wheel Company are the makers of the Victor bicycle; they call attention to their Safety with latest improvements. Owing to the small diameter of wheels the vibration is great. To overcome this they have introduced a spring fork which absorbs the vibration, and, so to speak, carries with it its own good road. One foreign manufacture of bicycles has an exhibit here in the Club-of the Coventry Machinists Company, of Coventry, England

The Springfield Roadster is also to be seen. This machine is known as one possessing good qualities as a hill climber and coaster. The use of the lever in place of the crank makes long distance riding a pleasure.

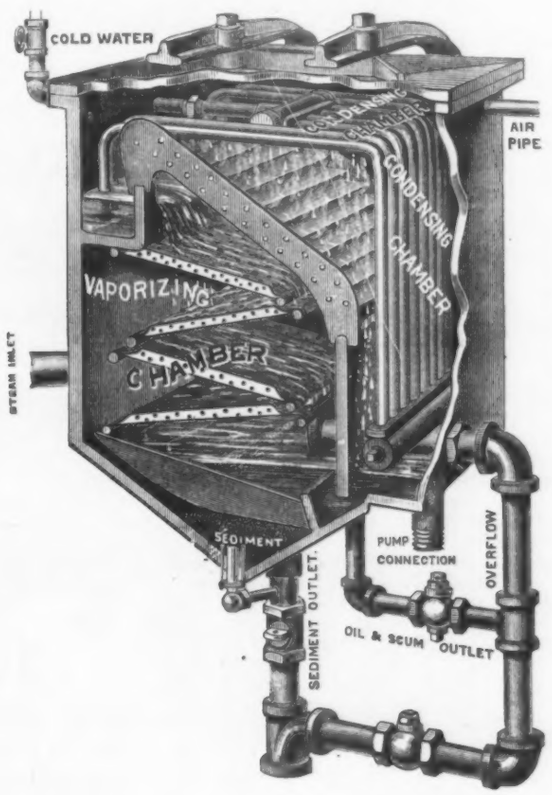
Messrs. W. B. Everett & Co., of Boston, show the Singer cycles in all patterns.

The most extensive and varied exhibit is that of the Pope Mfg. Company, of Boston, which includes bicycles, tricycles, &c., too numerous to mention. Among the curiosities is a bicycle made by a Pennsylvania boy, and used to ride hundreds of miles. The wheels are made of solid wood with a flat hoop iron tire. It is quite a clumsy affair, though it appears to have done good service. Next in interest is the oldest bicycle in existence. It shows by contrast what a vast improvement has been made in the adaptation of the bicycle to the needs of the day. The entire cycle exhibit is fine, showing, at a glance, a high order of mechanical perfection and taste.

Hodge, Howell & Co., exhibit their Unrivaled elevator head and boot, and combined head and hanger.

The Buffalo Belting Works, in addition to their patent web belting used on nearly all the running machinery, have a fine exhibit of leather belting. The graphophone also is exhibited and attracts a large number of visitors.

The Buffalo *Express* has an immense establishment in full operation, showing every detail of newspaper work, from editing to selling a paper, including telegraphic reports. They print the *Lightning Express* on a Scott perfection press. This is more than enterprising, and may prove to be the establishment of a new evening paper in Buffalo.



FEED WATER HEATER, MADE BY MESSRS. WARREN WEBSTER & CO., PHILADELPHIA, PA.

Mr. Charles M. Morse, superintendent of machinery, has worked night and day to get the machinery hall in running shape, and to his efforts are due the promptness with which every piece of machinery started at 10 a.m., September 4.

The preparations for building the armored cruiser Maine at the New York Navy Yard are well advanced, and work will be begun as soon as a good supply of material is delivered. The Maine is the heaviest of the vessels yet authorized for the new navy, and differs from the earlier cruisers, like the Atlanta, the Boston, the Charleston and the Baltimore, in carrying heavy armor.

On Thursday, the 6th inst., the Pittsburgh and Lake Erie Railroad made a reduction in the rates on iron and steel billets and blooms, in carloads of 24,000 pounds or over, from Pittsburgh, Chartiers, Phillipsburg, Beaver, Fallston and Beaver Falls to Cleveland, Ohio, to $1.25 per gross ton.

The Webster Feed Water Heater and Purifier.

What is known as the Vacuum feed water heater and purifier is being put on the market by Messrs. Warren Webster & Co., 491 North Third street, Philadelphia, Pa. The engraving which we annex explains its construction and operation.

The apparatus consists of a casing comprising an outer vessel or shell, in which are located a vaporizing or purifying chamber, a condensing chamber, a sediment chamber or receptacle, a delivery-pipe communicating with the vaporizing or purifying chamber and condensing chamber, water, steam, air and over-flow pipes, as shown in cut. The sediment chamber is provided with discharge-pipes and with suitable stop-cock and check-valve. The purifying chamber is supplied with steam through a pipe communicating with the exhaust of the engine or other steam supply and is also provided with an overflow-pipe leading to the drain-pipe of the sediment chamber.

The pump connection represents the delivery-pipe, which leads from the condensing chamber to the pump. The purifying chamber is formed by means of the front partitions extending entirely across the chamber and down into the sediment well. In this chamber are located a series of perforated trays or plates, and the highest plates communicates with the distributing device. In the sediment chamber are arranged a series of inclined plates; these plates are inclined in order to insure a perfect precipitation of sediment, and also to prevent any agitation of the same. The cold water inlet-pipe is for supplying water to the "purifier" and is provided with a cock or valve, and this pipe enters the condensing chamber at the top of the casing and supplies the water through the pipes in the condensing chamber to the distributing device. Above the purifying chamber and below the pipes in the condensing chamber are arranged a series of plates or steps, forming an inclined passage to allow vapors to pass freely from the vaporizing chamber, but to prevent the condensed vapors from returning into the former. An air outlet is provided, by means of which the air, liberated from the water, is withdrawn and prevented from accumulating in the condensing chamber. A branch pipe leads from the discharge-pipe and a water gauge communicates with the latter, showing the amount of water in the purifying chamber. All the inside parts are readily accessible.

It will be understood that action of the apparatus consists in converting the water to be purified into vapors, and re-converting the vapors back into a liquid state by the water next entering to be purified. The water is supplied to the purifying chamber, in which it is subjected to the action of heat, which removes the impurities from the water and causing them to fall into the sediment well, the heated vapors rising, enter the condensing chamber, and the moment they come in contact with the condensing surface the heat in the vapors is extracted and imparted to the entering volume of water before it enters the vaporizing chamber, and the vapors then drop in the form of liquid.

The grease and light impurities are prevented from passing out with the pure water by the partition wall extending below the level of the delivery-pipe, which entirely prevents them from entering the pump. The discharge or grease and scum-pipe leads from the bottom of the inclined plate nearest the delivery-pipe and is especially adapted for removing grease or scum which may accumulate by simply opening the cock. In case too great an amount of water should accumulate in the purifying chamber it will pass out through the overflow-pipe to the discharge-pipe.

Captain Jones on American Bridge Steel.

As the *Ironmonger* puts it, the "cat was let out of the bag" by Captain W. R. Jones, of the Edgar Thomson and Homestead Steel Works, at the meeting of the Iron and SteelInstitute. Mr. Jones is reported by our contemporary to have said:

A word in regard to the steel used in the United States. Their boiler-makers and their bridge constructors lacked one point in their starting out. He said: "Give your chemical specifications; start out with a decided chemical composition in your steel, then all persons who bid on the steel bid on equal terms." Where the physical properties were alone specified, each maker (and there were a great many of them in America) would put in the cheapest kind of steel that would possibly reach that specification. The general result was that steel largely entered into the construction of bridges in the United States that had no business to be there. For the boilers alone of the Edgar Thomson Steel Works, their specifications were far more rigid than that of the United States Government for boilers for their cruisers. The Edgar Thomson specifications limited the phosphorus to 0.035, and the manganese to 0.035. When those specifications were first given out, the steel-makers refused to conform to them, but he insisted, and that was the character of the work. He specified that no holes were to be punched, and that the drift was to be absolutely kept away from the work, and he sent an inspector to have it carried out. With regard to the bridge material, he knew of his own personal knowledge that there had not been the proper care taken in the manufacture of steel. He had seen steel made for bridge structures; the heat was blown very rapidly—in probably eight minutes—the ferromanganese was put in cold, and he did not think the reaction had taken place yet in that steel. (Laughter.) On assuming general charge of the Homestead Steel Works, where they had succeeded by a different practice in not making good steel, he radically changed that, and he thought that Mr. Clark would testify that the steel he received from the Homestead Steel Works in the year 1888 was certainly of a very high class. A large series of tests were made, showing that the steel was homogeneous, and was remarkable in its even results; he was sorry he had not got the results with him. He fully coincided in everything the president had said, and the meeting would notice that the heartiest applause came from that side of the house in which he sat. He would now say, in conclusion, as he had said to Mr. Clark before, at such another assembled body of wise men, that he held as a cardinal principle—and again he would say that if he had this great dictatorial power he would enforce it, and it should be enforced by law—that no member of a bridge construction should have an excess of 0.65 in phosphorus. That was the uttermost limit that he would allow. He was opposed to the excess. He would keep the manganese as low as possible, as it is a great oxidizing agent, particularly in boilers. They could readily keep under ¼ per cent. of manganese. To start with, however, the chemical properties must be specified; then all contractors bidding on this bridge steel would enter the race on even "terms." He wanted first to have the chemical composition of the steel correct; then the physical tests could follow. (Applause.)

How correct this version of the remarks of Captain Jones is we are not in a position to state. The *Ironmonger* is very enterprising in giving an early report, but at times its zeal is evidently greater than its discretion. During the same meeting it attributed to M. Gautier the following choice bit, a part of the discussion on Mr. Hadfield's paper: "They employed a very soft kind of steel, because as the head of the nail was covered by the hole, they were sure that the wear and tear of this steel was not higher than it was in the steel."

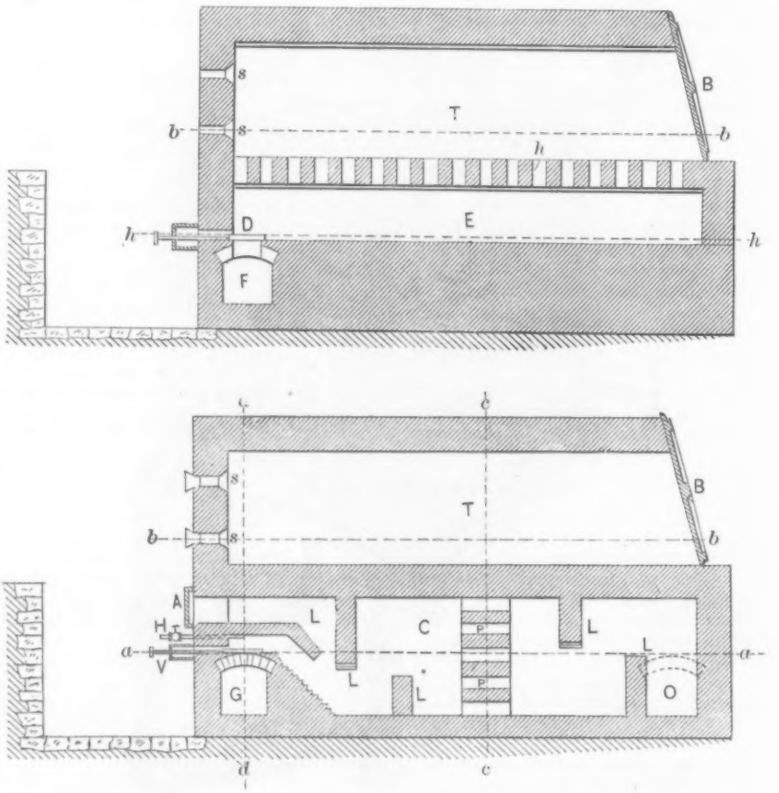
While it is possible that Mr. Jones may not have been well understood by a reporter evidently without technical training, the conclusions drawn editorially from his remarks, in a later issue of the *Ironmonger*, may prove entertaining. We quote in full:

Bessemer steel manufacturers in this country have long been astonished and puzzled by the extraordinary output of the Bessemer works of the United States. Not merely in respect of the number of blows, but also as regards the tonnage per week or month, the American makers of Bessemer steel appear to be far ahead of us—so far, indeed, that our manufacturers are very curious, not to say anxious, to know "how it is done." In Great Britain the practice pursued in producing Bessemer steel is fairly uniform, and it is generally conceded that considerable expedition characterizes the work from beginning to end. Yet, with all our skill and knowledge, we are admittedly behind the American makers to a very marked extent. They seem to get more steel in a week out of 7-ton converters than we do from 10-ton converters. A remark made at last week's meeting of the Iron and Steel Institute by Captain Jones, of the Edgar Thomson Steel Works, may, perhaps, aid in elucidating the mystery. Captain Jones said that proper care had not been taken in the manufacture of certain American steel for bridges, and he "let the cat out of the bag" by stating that the "blow" was probably performed in not more than eight minutes, and the ferromanganese put in cold. If that period represents anything like the general length of time given to the "blow" in the United States, we need wonder no longer that so many heats per shift are got out in the Bessemer works there. A shortening of the blowing time by from 80 to 100 per cent. must mean a good deal in a week's work, and the fact goes a long way in helping us to understand the enormous outputs of the American works. It is an entirely different question as to whether the steel thus produced is what it ought to be. If Captain Jones is correctly informed—and so able a gentleman certainly is in a position to know whereof he speaks—it is obvious that a good de l of the American Bessemer material must be of very poor quality. The very short blow is likely to render that result moderately certain, but to put in the ferromanganese cold is quite sufficient to make the product anything but steel. In saying this we do not seek to attach general discredit to American Bessemer steel, but desire simply to show that where really good and well-made steel is to be turned out it is not possible to make it in substantially less time or in much larger quantities than is done by our own works. This is true of ordinary rail steel, and is necessarily even more emphatic in relation to steel containing specified percentages of carbon for purposes other than rail making.

It is stated that the French cruiser Alger is to have triple-expansion engines worked at 240 pounds per square inch, furnished by Belleville boilers.

Wells' Rustless Iron.

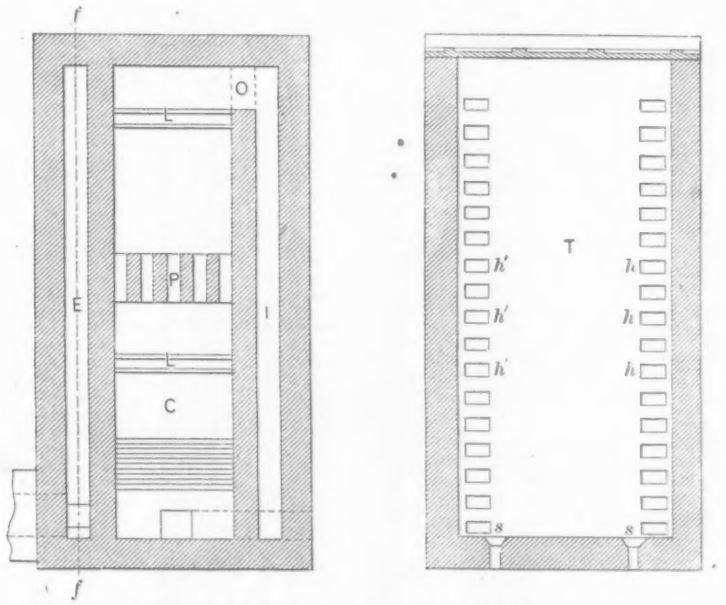
The Wells Rustless Iron Company, 21 Cliff street, New York, had for some time previous to this year been manufacturing protected ironware under the Bower-Barff patents. A year or more ago, however, they began experimenting with a new process, the invention of Mr. W. T. Wells, the president of the company, and since the first of the year they have been using the Wells process exclusively. Iron protected by magnetic oxide has become such a popular article in many lines of trade that a description of this new process will be of interest to our readers. We will describe at first the process and follow with a description of the furnace used. The charge of iron or steel articles to the amount of some 12,000 pounds weight is placed in an ordinary muffle or heating chamber and there gradually heated during a period of some 12 hours. It is important not to heat any part of the charge so as to blister it, and yet every part must be raised to the dull-red heat required by the process. The inventor prefers to use the gas made by the well-known Siemens' Producer in heating the charge and to admit air in limited quantities into the chamber along with the gas coming from the producers just enough to consume the latter and give a small flame in the chamber. During this operation the dampers are opened, permitting the escape of the products of combustion into the chimney. The heating must be gradual so that the charge will be raised in temperature evenly and equally and all blistering avoided. The increase of temperature should be so regulated that the maximum of heat is reached at the end of about 12 hours, though if a smaller charge than the one mentioned is used a shorter period will suffice. The surface of the charge by this gradual heating is apt to become somewhat oxidized both to red and black oxide, but the effect is irregular



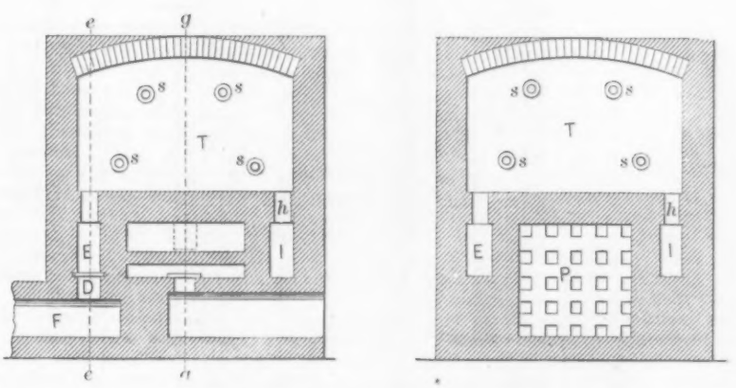
Figs. 1 and 2.—Vertical Longitudinal Sections of Furnace.

WELLS' RUSTLESS IRON.

and patchy where it does appear at all, and is not of any general importance in the result. The next and final step in the process is to turn on a mixture of steam and carbonic oxide gas when the chimney damper is closed. In this atmosphere of steam and carbonic oxide the charge is left for some five hours, more or less. The heat of the charge at the beginning of the operation is a dull-red and air should be excluded as far as possible. The steam, it is said, need be under little or no pressure, and may or may not be super-heated before introducing into the chamber. This final step of the process is the essential one, in which is produced the desired result of black or magnetic oxide. We will now describe, with the aid of sectional views, the furnace employed, which is an ordinary muffle or heating chamber of the usual construction. It does not require any special appliances to make it absolutely air or steam tight, or capable of standing high pressure, as the Wells process, it is said, does not require such elaborate or costly apparatus. The inventor does not limit himself to the employment of any particular kind of apparatus, but following is a description of what he considers the best means for carrying out his process. Referring to the engravings, Figs. 1 and 2 are vertical longitudnal sections of the furnace, which is built of masonry, in the ordinary way, about 5 feet high, 25 feet long and 6 feet wide. Figs. 3 and 4 are horizontal sections of the furnace, while Figs. 5 and 6 are transverse vertical sections. The section in Fig. 1 is made on the line *f f* (Fig. 3), and on the line *e e* (Fig. 5). Fig. 2 is a section on the line *g g* (Fig. 5). Fig. 3 is a section on the line *h h* (Fig. 1) and on the line *a a* (Fig. 2). Fig. 5 is a section on the line *d d* of Fig. 6. Fig. 6 is a section on the line *c c* (Fig. 2). Referring now to the special parts of the furnace V is the gas valve; A (Fig. 2) is an air valve; G is a gas flue; H is a steam valve; C combustion chamber; O (Fig. 2) an opening into the port chamber I (Fig. 6); *h h h* (Figs. 1, 4, 5 and 6) port holes; T is the main heating chamber; with an escape at E (Fig. 3); D is a chimney damper (Fig. 1) and F in the same figure is the chimney flue; P (Fig. 2) is a checker work in the combustion chamber; *s s s* are sight holes in the back of heating chamber; *l l* are curtains of masonry. When the articles are to be treated for the production of a rustless oxide on their surface they are placed in the heating chamber T, by being drawn in upon a drag through the door B (Fig. 2). The charge is gradually heated up through a period of, say, 10 to 12 hours, according to the size, by means of gas from a Siemens producer, admitted through the flue G by opening the valve V. A small quantity of air is also admitted for the purpose of combustion by opening the valve at A, Fig. 2, during which operation the damper D, Fig. 1, is opened, permitting the escape of the products of combustion to the chimney. The gas, entering through V, mingles with the air passing through A at the extremity of the curtain, and is further mixed with the air by the checker-work P in the combustion chamber. The burning gas, passing through O, enters the port chamber I (Figs. 3, 5, 6), from which it passes up through the portholes *h* around, through and over the charge in T, and thence through the portholes *h* into the escape flue E, to the chimney flue F. When the charge has been heated to a dull red, the valve A, Fig. 2, is closed and steam is admitted through the valve H, the damper D being closed. For five hours the charge is submitted to the action of the mingled steam and carbonic oxide gas, the air being excluded as far as possible. The magnetic oxide produced by this process is described as very hard and comparatively elastic. It stands frictional wear well, but is apt to be injured by hammer blows or rough usage. Wherever the coating is removed rust will form, but it will not burrow under and raise the adjacent coating. The works of the Wells Rustless Iron Company are situated at Little Ferry, N. J., but a short distance from Jersey City, where there are furnaces for treating all kinds of iron and steel. They describe their process as especially adapted to wrought iron pipe for water conveyance, grate frames and fenders, architectural ironwork, ship work, gas, culinary utensils, cast-iron soil pipes and plumbers' castings, &c.



Figs. 3 and 4.—Horizontal Sections of Furnace.

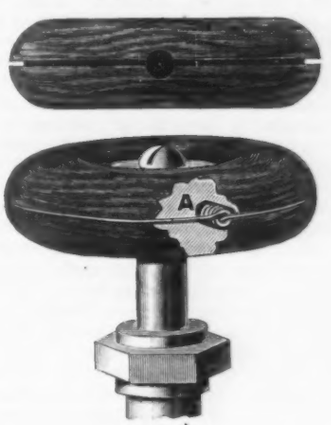


Figs. 5 and 6.—Transverse Vertical Sections of Furnace.

WELLS' RUSTLESS IRON.

Wire Bound Wood Hand Wheel.

For manipulating steam valves on radiators and cylinder lubricators a non-conducting wheel is required, and, as these wheels are usually made of wood, they are very easily split and broken off by heat or from a slight blow, thus making it difficult to open or close the valves, and the latter are a constant source of trouble. To prevent this trouble and to make the wheels more durable Mr. F. Lunkenheimer, proprietor of the Cincinnati Brass Works, Cincinnati, Ohio, has brought out a simple and efficient binder, the nature of which will be readily understood from the annexed cut. The wheels are circumferentially grooved and a wire bidder is inserted, the ends of which are twisted and sunk in a pit, as shown at A. The wire, as well as the groove, may be covered with a suitable cement of the same color as the handle and thereby made invisible. The binding of handles in this way is not expensive, and, as cheaper woods can be used in handles thus bound, the extra expense is very little.



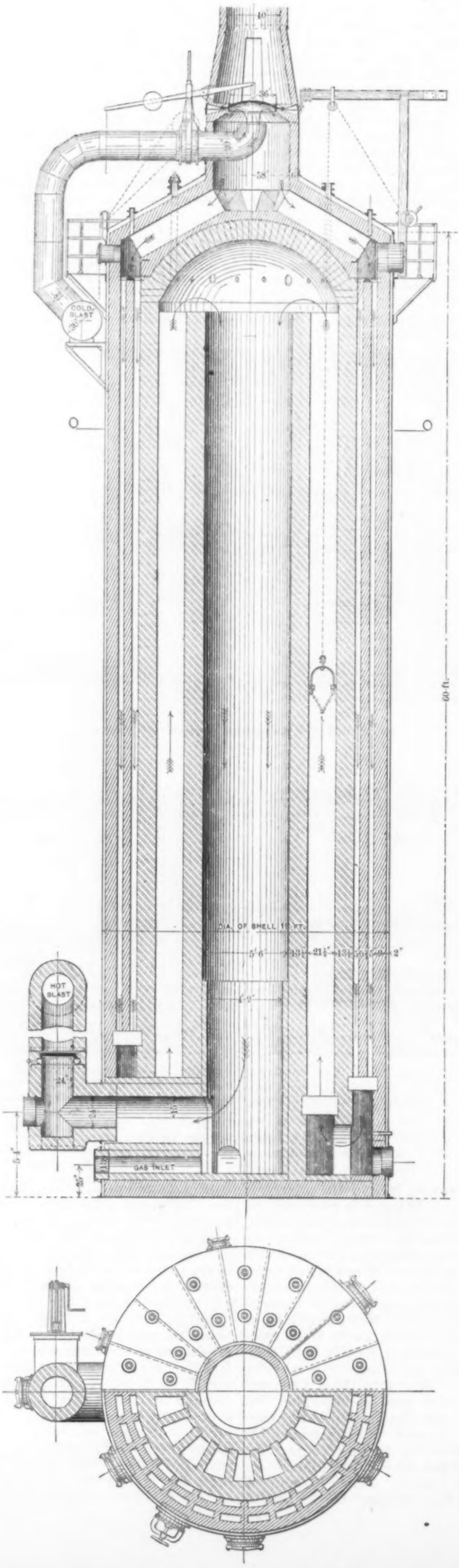
Wire Bound Wood Hand Wheel.

The Massick & Crooks Hot-Blast Stove.

Among the hot-blast stoves which are widely used abroad but until lately little known in this country is the Massick & Crooks which is now being introduced by McClure & Schuler, of Pittsburgh. Up to August, 1886, 60 of these stoves had been built in England and Scotland, the following works being equipped with them: Askan, 15; Blaine, 4; Seaton-Carew, 8; Carlton, 1; Millom, 8; Parton, 1; Airdeer, 6; Glengarnock, 9, and Workington, 8. In this country the first were built about ten months since for Schoenberger, Speer & Co., of Pittsburgh, and lately contracts have been closed for three stoves 16 feet 6 inches by 60 feet for the Williamson Iron Company at Birmingham, Ala., three stoves, 18 feet by 65 feet, for one of the Milwaukee furnaces of the North Chicago Rolling Mill Company, and three for the Brier Hill Iron and Coal Company, of Youngstown.

The accompanying engraving shows the construction of the stove. The shell is a wrought-iron cylinder with a cone-shaped roof. At the apex of the roof is placed a chimney to carry off the gases while the stove is being heated, thus obviating the necessity of having an underground chimney flue, and large and expensive draft chimney which occupies valuable space. The stove has a central combustion, outside of which are large segmental shaped flues which lead the gases down and into the outside flues. The latter are smaller, segmental in shape, the gases passing through them and out through the chimney. The walls are all heavy and the passes large, thus avoiding the drawback of securing a large amount of heating surface at the expense of thin walls. McClure & Schuler state that in their experience that a stove having thick walls when thoroughly heated up will retain the heat longer. This was demonstrated a short time ago. Shoenberger, Speer & Co. had a break out at the hearth of their furnace. They had the blast off the furnace for eight hours. When work was resumed they had 1200° of heat to start with. By having a central combustion chamber circular in form the greatest heat is in the center, thus equalizing the expansion. This chamber can be entirely removed and replaced without disturbing any part of the brickwork, and there are no straight or parallel walls to get out of shape from heat expansion and contraction. Where the cold blast is introduced into the stove it blows against the underside of the chimney valve, thus automatically closing it. The wind breaking its force on the valve before coming in contact with any part of the brickwork. This is considered very important by the designers, as they find the introduction of the blast in another manner cuts out the joints, weakening the walls.

For cleaning, a series of plug holes with tight-fitting caps are provided, as shown in the plan. Through these holes a small coil chain is passed to the bottom of flue; a spring scraper that neatly fits the flue is attached and the chain is wound up by a portable crane shown on elevation. An arrangement is also provided by which the flues can be blown out as desired. The stove flues being divided into six compartments, a cleaning door is used to get access into the bottom of stove. On these doors there is a fly-back relief-door, which is suddenly opened when the pressure is on the stove, causing a rapid flow of the blast toward the flues whose relief-door is open. By this means the flues are to a great extent cleaned. These doors are opened alternately when changing from blast to gas In the case of the stoves erected at the furnace of Schoenberger, Speer & Co.,



THE MASSICK & CROOKS FIRE-BRICK HOT-BLAST STOVE.

in Pittsburgh, about ten months ago, the only cleaning ever done since starting was to remove the accumulation of dust at the bottom of the stove and that was done only once.

Schoenberger, Speer & Co. report that after eight months' use the stoves gave 1400° to 1600° of blast temperature as readily as when they were first used, and that during that time they have not noticed any weakness in any part. The following is a copy of the record of the casts, running on Bessmer metal, from August 2d to 10th:

Cast No.	Silicon.	Sulphur.
1021	2.32	0.002
1022	2.30	0.004
1023	2.85	0.006
1024	2.15	0.004
1025	2.31	0.002
1026	2.63	trace
1027	2.74	trace
1028	2.75	trace
1029	2.10	0.005
1030	2.32	0.01
1031	2.47	trace
1032	2.55	trace
1033	2.29	0.004
1034	2.65	trace
1035	2.01	0.01
1036	2.55	trace
1037	2.52	trace
1038	1.96	trace
1039	2.04	0.008
1040	2.17	trace
1041	2.17	trace
1042	2.12	trace
1043	2.12	0.008
1044	2.08	trace
1045	2.73	none
1046	2.13	0.002
1047	2.28	0.007
1048	2.25	0.003
1049	2.38	trace
1050	2.23	0.004
1051	2.46	0.035
1052	2.52	0.004
1053	2.25	0.003
1054	2.52	trace
1055	2 32	0.002
1056	1.85	0.002

The consumption of fuel to the ton of iron during that time is reported by Schoenberger, Speer & Co. to have been 2018 pounds of coke.

Pittsburgh Nail Manufacturers.—Announcement is made that Shoenberger & Co., formerly one of the largest nail-making concerns of Pittsburgh, have decided to abandon that industry and will shortly dispose of their nail machines, 92 in number. The principal reason advanced for this step is that after the usual summer stoppage for repairs and operations were about to be resumed the nailers in the employ of the firm demanded a considerable advance on the regular scale for cutting chisel-pointed nails, the manufacture of which is a specialty of the firm. This demand was refused and the nail factory has been closed down. The retirement of this firm from the nail business leaves but two concerns in Pittsburgh engaged in the manufacturing of nails. These are Jones & Laughlins, Limited, and Chess, Cook & Co., with 63 and 96 nail machines respectively. Less than five years ago there were nearly as many nails made in Pittsburgh as in Wheeling, while to-day it is probable that the smallest concern in Wheeling is making more nails than are manufactured by the two remaining works in Pittsburgh. The principal reason of this great change here is the fact that the Pittsburgh nail manufacturers have been compelled for years to pay more for nail cutting than is paid in either Wheeling or at any of the factories located in Ohio. It is a well-known fact that for months past the Wheeling manufacturers have been selling nails in Pittsburgh for less money than the Pittsburgh manufacturers can make them. For this reason the manufacturers at Pittsburgh have gradually given up the manufacture of nails, and, unless a wonderful revival in the trade should take place, the manufacture of nails at that city will soon be a thing of the past.

The Iron and Steel Institute.

Edinburgh Meeting.

The first paper read before the Iron and Steel Institute at the Edinburgh meeting, by Daniel Adamson, on a compound lever-testing machine of 15,000 powers, is not of sufficient interest to call for reproduction, especially since the accompanying drawings have not yet been published. The second contribution to the proceedings of the meeting, by R. A. Hadfield, of Sheffield, is likely to attract more general attention, since it gives additional data on

Manganese Steel.

This new steel has drawbacks that at present interfere with its usefulness and commercial introduction. The chief one met with is its hardness. The majority of articles used in machine construction of any kind must be tooled, fitted or adjusted to shape, and this is almost out of the question with this material—in fact, in its machining it may be described as equal to the hardness of chilled iron. No doubt, by experiments and perseverance, this and other difficulties will be overcome, and possibly this very drawback may eventually prove a blessing in disguise, inasmuch as should some better method of machining or finishing be perfected, it should be equally beneficial to all branches of engineering.

A series of experiments was commenced at the Hecla works, Sheffield, some few years ago, it being thought possible that steel with high manganese might give a hard material, somewhat like spiegeleisen, but without the brittleness of the latter, seeing that the carbon should be so much reduced. After many trials a material was produced combining great strength with hardness, but the puzzling and apparently paradoxical result was discovered that, although steel, if it may be so termed, with 4 to 6 per cent. of manganese, and less than ½ per cent. of carbon, was so brittle that it could be powdered under a hand-hammer, yet, by adding twice this amount of manganese, just the contrary effect was produced, and a material was obtained containing many apparently new properties, as compared with any iron or steel hitherto manufactured. Briefly, the material may be described as follows: That containing from 2½ to 6 per cent. is extremely brittle in its cast state; then a return in strength gradually takes place, and, with about 9 to 10 per cent., a cast bar, 2½ inches square, can be bent considerably out of the straight without breaking. This continues up to about 14 or 15 per cent., when a decrease occurs in actual toughness, though not in transverse strength, and after about 20 per cent. is passed, then a rapid decrease again takes place. It should be stated that these remarks apply specially to the material in its cast state.

Possibly, if ferromanganese were made with less carbon, or if pure metallic manganese could be obtained, the maximum of strength might occur with even higher manganese; but now, as the higher percentages are approached—say over 16 per cent.—the experiments become more complicated, owing to the presence of 1½ to 2 per cent. of carbon, which must necessarily interfere with the action of the manganese. It would be interesting to note the effect of adding metallic manganese—*i.e.*, without any carbon, but, after many attempts, the writer has been unable to obtain such a metal. Samples supplied as pure manganese were generally found to contain not more than about 90 per cent.—in fact, it seems doubtful whether the exact characteristics of the metal are really known, and probably the samples under examination, and supposed to be pure, have been mixed with impurities. Manganese steel is not so liable to honeycombs as ordinary steel, and the addition of silicon is unnecessary. It is very fluid, and can be run into thin sections, but cools more rapidly than ordinary steel, and its contraction is decidedly greater. This latter fact explains the reason of its piping and settling so much, both in the ingots and in castings; with proper heads or runners, however, this difficulty can be obviated. It is manufactured by any of the ordinary steel-making processes, the basis—*i.e.*, the material before the ferromanganese is added, being preferably decarbonized iron (practically pure iron, Fe), or mild steel. The ferromanganese is added in a molten state, or very highly heated. The steel is then ready for casting into ingots or other forms. It is most important that the carbon should be kept as low as possible, especially in the 14 per cent. material, where it should not exceed about 1 per cent. or the product will be inferior. For this reason the ferromanganese used should contain high percentages of manganese, such as 80 to 84 per cent., now easily procurable at as low a price as 9 shillings per ton. About 0.50 per cent. of the manganese is oxidized—that is to say, to obtain a steel with about 13 per cent., about 13½ per cent. of manganese must be added. In other words, the following mixture gives the above analysis:

	Pounds.
Ferromanganese, 80 per cent.	375
Very mild steel or decarbonized iron	1,865
Total	2,240

This would give a ton of 13 per cent. manganese steel.

MANGANESE STEEL, 7½ PER CENT. AND UPWARD.

A. *Cast State.*—After passing about 7 per cent. an increase in strength occurs, and with about 10 per cent. a 2½ inch square bar will bend considerably before breaking, although with a comparatively low transverse strength, the latter rapidly rising as the manganese increases, but the samples with higher manganese and higher transverse strength are not so tough as this 10 to 14 per cent. material. Speaking of these latter percentages, it has been found from the commencement of the experiments with this material that, notwithstanding its toughness as ordinarily cast, an extraordinary gain in strength is obtained by methods which, in ordinary steel, would cause brittleness, water cracking and other defects. This process is termed "water-toughening," and consists in heating the article under treatment to about 1800° or 2000° F., and then plunging it into cold water. The nearer the above temperatures are approached, and the colder the water, the tougher will be the material. The writer is at present unable to say whether this treatment would be found applicable, and in the same degree beneficial, with articles of large size, but he believes that with proper apparatus and methods of cooling, such as the rapid introduction of cold water into the bath to keep down the temperature, similar benefits would result. As, however, the difficulty of tooling and machining this material has not been overcome this point has not been experimented upon. The beneficial action of the water-toughening process will be seen from the actual results and tests obtained with the different articles described in this paper. It will also be seen that this toughening applies equally to material in its cast and in its forged state, and in both cases the increase in strength may, without exaggeration, be termed most remarkable.

Take, for example, small pieces of this material in its cast state, 12 inches long, 1½ inches wide, and ⅝ inch thick. After water-toughening, notwithstanding their hardness and stiffness, such strips can be bent double cold, almost in the same way

as a piece of the mildest forged steel, the apparently contradictory qualities of hardness and toughness being here obtained. This material has been tested and found well adapted, owing to its combined hardness and toughness, for couplers as used in coupling railway rolling stock in America, where nearly all cars or wagons have a coupler, drawbar, and buffer combined in one. The writer's firm has now the sole license out of America for making the well-known Janney coupler, so largely used on leading railroads in America, and introduced into this country by Mr. A. Davis, C.E., of Westminster. The couplers tested weighed 125 pounds each, and in no place excepting at the jaws are the castings more than $\frac{5}{8}$ inch thick.

The tests were made with an ordinary drop tup, weighing 2324 pounds, sliding between steel rails, and the hight could be varied from 1 to 27 feet. Each casting was placed vertically, the tup falling upon the jaws, and the permanent set being carefully measured after each blow. All the couplers except No. 1 were made at the Hadfield Steel Foundry Company's works.

No. 1. American malleable iron casting.

No. 2. Manganese steel casting (Mn., 9.37 per cent.), tested just as cast.

No. 3. Mild steel casting (carbon, 0.25 per cent). The material of which this coupler was cast had a tensile strength of 32 tons per square inch, with an elongation of 30 per cent. on 2 inches.

Nos. 4 and 5. Water-toughened manganese steel castings with 9.75 and 14.25 per cent. Mn., respectively.

Table I gives a sumnary of the tests and effects produced by the total forces exerted on each casting. The effect of low temperature on these castings has been noted by Mr. Harrington, mechanical engineer of the Pittsburgh, Cincinnati and St. Louis Railroad. A light manganese knuckle, weighing about 50 pounds, belonging to a coupler head, was immersed for 30 hours in a freezing mixture of salt and ice. The casting was so cold that upon touching it the hand was "burnt." A drop tup was then allowed to fall upon it from a hight of 25 feet, the only effect being a slight indentation in the casting. It may be also mentioned that the effect of higher temperature upon this steel has been noticed and that no change is observed until a temperature of about 400° F. is reached. For particulars of the foregoing temperature tests the writer is indebted to Mr. J. D. Weeks, of Pittsburgh, Pa., who has taken special interest as to this steel in America. As regards the effects of increasing temperature, Mr. Strohmeyer, who has read an interesting paper upon a similar point as affecting ordinary iron and steel, has experimented with this material and found that it bent while blue hot from 21 (lowest) up to 36 (highest) times, as against 3 to 5 for Low Moor iron, and 2½ to 7 for very mild Siemens steel. At a blue heat, therefore, it seemed to work better than iron. The Chatillon Company, in France, are experimenting with this material in the direction of using it for armor plates and other purposes. Another noteworthy test has been made with a cast flanged pipe No. 671 (Mn., 13.5 per cent). Notwithstanding the thinness of the walls ($\frac{3}{8}$ inch), it safely bore a pressure of 5600 pounds per square inch and did not burst until 6160 pounds had been applied.

All the foregoing examples were water-toughened specimens. Other specimens, tested in their ordinary cast state, may be mentioned, such as a cast axe which has chopped through square (cold) iron, and cast razors, which, while not equal to those of ordinary steel, have done fairly well. Still, owing to the peculiar softness noticed with this material when under compression, it is hardly suitable for tools carrying a thin cutting edge. In grinding up a manganese steel axe, Mr. C. W. Hubbard, of Pittsburgh, noticed that the material possessed a close, hard and peculiarly greasy nature, and he considered that it possessed the very essence of anti-friction. A bearing was put to work at the Hecla foundry, under a shaft 2¾ inches in diameter, carrying a load of 3 cwt., and after having been at work 2½ years it is but slightly worn. It is estimated that the number of revolutions made by the shaft has been close upon 5,000,000. As indicating its toughness, and showing how even practical steel makers may be deceived in the appearance of its fractures, it may be stated that when the material was being tested at the Crescent Steel Works, Pittsburgh, the blacksmith to whom an ingot was given to break was inclined to be sarcastic as to the "scalded ingot" (Mn. 10.89 per cent.), as it was termed, and said that it would be easily broken with a sledge hammer. Not only was he unable to do this, but ten blows from the steam hammer were required to cause a fracture. A singular point about the fractured appearance of the 9 per cent. material may also be mentioned. When water-toughened, though the metal is greatly increased in strength, this is certainly not owing to structural changes, as the pronounced form of crystallization of the ingot or casting is not to the eye in any way altered. It will, therefore, be understood how difficult it is to offer any satisfactory explanation of the gain in strength by this treatment, which, in all ordinary steel, would be so detrimental. Another important use of this material, and one which led to the commencement of these experiments, is its application as a hard material for car and other wheels, to compete with those made of chilled iron in America and elsewhere. The difficulty was at once met with that if the wheel was cast in one piece, although exceedingly tough, it is hard to the tool throughout, and it is impracticable to bore out the boss. Attempts were made to cast, in the boss, soft steel or iron bushes, but this was generally unsuccessful owing to the contraction splitting the boss when cooling. A more successful method has been that of casting the wheel in two parts, then bolting or otherwise fastening them together; or that of casting in the hard tire wrought iron or soft steel arms, on to which an ordinary soft steel boss could be afterward bored, was cast. In either of these cases the tires are readily trued or ground up, as practiced in America. Wheels of this class have been used with satisfactory results. On the Nottingham tramways a set ran over 30,000 miles under severe conditions, the gradients averaging as much as 1 in 18 for about one-half the route of the daily journey. In this case a peculiar point was noticed—viz., that whereas the cast-iron wheels are liable to slip when going down an incline the chilled brake-blocks bite much more effectively on manganese wheels, enabling the car to be stopped sooner. The Chester Tramways Company has had a set running for over two years, which up till now have run over 45,000 miles, and are not yet worn out. Wheels of this description can be tested with more than 100 blows with a heavy sledge-hammer without fracture occurring, and at the same time the tire is so hard that a chisel will not touch it. A set put to work in America has already run 200,000 miles, under heavy engines of the consolidation type, on the New York and New England Railroad. The life of ordinary chilled iron wheels does not average more than 50,000 miles.

Table 1.—Comparison of Sets Produced by the Different and Total Forces Exerted on each Casting.

Energy exerted.	Effect produced on				
	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
	Malleable Iron.	Manganese Steel as cast, 9.37 per cent. Mn.	Special Mild Steel Casting, 0.25 per cent. Carbon.	Manganese Steel No. 668, water-toughened, 9.75 per cent. Mn.	Manganese Steel No. 669, water-toughened, 12.25 per cent. Mn.
Foot-tons.	Inch.	Inch.	Inch.	Inch.	Inch.
43.37	0.90 set and broken	0.20 set	0.35 set	0.25 set	0.15 set
96.79	.....	0.35 " and broken	0.65 "	0.40 "	0.35 "
180.82	.....	.....	1.05 " and broken	0.60 "	0.50 "
236.84	.....	.....	.....	0.65 " not broken	0.55 "
320.87	.....	.....	.....	.....	0.65 " not broken

B. *Forged State.*—The original gives elaborate tables of tests and analyses and diagrams, too extensive for reproduction, but the following examples will suffice to show some of the results. A steel carrying 13.75 per cent. Mn., when water-toughened, possessed a tensile strength of 65 tons per square inch, with 50.7 per cent. elongation on 8 inches. Another specimen, with 14.27 per cent. Mn., gave 69 tons and 46 per cent. In the latter case, calculating the breaking-load on the area of the bar at the moment of fracture, the load was equal to the high amount of 102 tons per square inch. Another sample gave 65.61 tons with 48.4 per cent. elongation, and was still unbroken. As before pointed out, after passing about 14 per cent. the material again loses strength. This is no doubt owing to the higher amount of carbon necessarily present. Nevertheless, it has been possible to forge specimens with 20 and even 22 per cent. manganese and over 2 per cent. carbon. Thus, while an alloy of 97¼ per cent. of iron and 2¾ of carbon is practically unforgeable, an example is here met with where an alloy of 78 per cent. of iron, 2 per cent. of carbon and the rest of manganese is quite malleable. Ingots and castings containing 14 per cent. of manganese and weighing 28 to 30 cwt. have been successfully cast and forged; these may be termed fairly large pieces.

It has been thought by eminent metallurgical authorities, if this material was not a true alloy or steel, that in large masses the manganese would concentrate or separate toward the center, such as has been found to be the case in ordinary steel ingots. The above examples, however, prove that this is not so, as wire rods No. 8 B.W.G., drawn out of blooms made from ingots about 18 inches square, were found quite uniform in their percentage of manganese, as compared with the analysis

of the original ingots, thus proving that this manganese steel is a true and stable compound or alloy. Care must be taken not to overheat the ingots, or they burst and crack under the hammer. With proper care, however, there is not much trouble beyond that the steel works hard, or similarly to tool steel containing, say, 1¼ to 1½ per cent. carbon. As in lower percentage, so in this, the peculiar crystallization noted entirely disappears after forging, and a close grained metal is obtained. The bars, as received from the forge, are comparatively brittle, but reheating to a yellow heat, and cooling in air, increases the ductility five or six times. It is, however, specially with the water-toughening process, as already mentioned, that the extraordinary toughness, which is the special characteristic of this steel, is noticed. Oil has a beneficial effect, but not equal to that of either water or sulphuric acid, this, no doubt, being owing to its slower conductivity. The operation of merely heating the forged test-bar to yellow heat and cooling it in air has a very beneficial effect, the elongation in most cases showing a considerable increase, and the tensile strength, also rising 8 or 10 tons per square inch. It is somewhat curious to notice the remarkable rise both in tenacity and elongation in the 14 per cent., as compared with the 10 per cent. material. Why should the extra 4 per cent. manganese cause such a remarkable difference? The writer thought that possibly this 14 per cent. material might owe its increased tensile strength to the higher carbon present, but an experiment proved that this was not so, as a 10½ per cent. sample, with similar carbon to the 14 per cent., gave no higher tensile strength and its elongation was decidedly less.

The following tests were made to compare the forged and water-toughened manganese steel, carrying Mn. 12.55 per cent., with the best quality of steel as used in railway axles. The tup was the same as that used for the coupler tests, the axle being reversed after each blow; bearings 3 feet apart; weight of tup, 20¾ cwt. The bars were 4½ inches diameter and 4 feet 6 inches long. The results of these tests show that on the manganese steel bar or axle an energy of 498 foot-tons only produced total deflections of 39 inches (*i. e.*, the sum of all the deflections), whereas in the special steel axle an energy of 48 foot-tons produced total deflections of 105¼ inches.

Table II.—Comparison of Deflections Produced on each Axle.

Effect produced by the number of blows as under.	Energy developed in foot-tons.	Sum of permanent deflections or bends in inches produced on	
		No. 1 Special steel axle.	No. 2 Manganese steel axle.
At the 5th.	79.883	24.953	8.501
At the 10th	208.531	66.188	19.403
At the 15th	348.591	105.248 and broken	30.212
At the 20th	497.988	.....	39.491 and broken

The peculiarly combined toughness, hardness and stiffness of the forged manganese steel are very clearly brought out in these tests. The material, therefore, seems specially adapted to resist severe stress before fracture, and yet, at the same time, to show very slight alteration under stress.

Peculiar Hardness.—It is somewhat difficult to describe this quality, because all the specimens are exceedingly hard—in fact, it is scarcely possible to machine any of them on a practical scale. Yet such hardness varies considerably in degree, being most intense in the cast material containing 5 to 6 per cent. of manganese, which no tool will face or touch. A slight decrease then occurs, and the 10 per cent. material gives comparatively the softest condition. Upon a further addition of manganese an increase again takes place, and at 22 per cent. it is very hard, though still not so much so as in the 5 per cent. material. An example may be given of the forged test-bar with (Mn. 14 per cent.) which elongated 44½ per cent. without fracture, and sustained a tensile load of 67 tons per square inch. This was put under a double-geared 18-inch drill, and more than an hour was occupied in drilling one hole ½ inch diameter by ¾ inch deep. Even to do this, it was requisite to run at the slowest possible speed, or the edge of the drill would have given way. Yet this specimen could be indented by a hammer, so that, while so hard, it may be said to possess a special kind of softness. This softness, if it may be so termed, is noticeable when testing the material for compression. Specimens of 10 per cent. manganese steel, 1 inch long by 0.79 inch diameter, although requiring several days' preparation in the lathe, owing to their hardness, yet, under a compression load of 100 tons per square inch, shortened 0.25 inch, and the harder kind (15 to 20 per cent. Mn.) 0.1 to 0.13 inch. Ordinary mild steel would shorten 0.5 inch under the same load, but chilled iron or hardened steel would stand this test without any alteration. It is difficult to explain the cause of this peculiar hardness, because manganese, when added to copper, does not produce this remarkable change, and why, therefore, should manganese added to iron, which in its pure state is but little harder than copper, produce such a hard alloy?

MANGANESE STEEL IN FRANCE.

M. Gautier, in the discussion of the paper, referred to experiments being carried on at the Chatillon et Commentry works, in France, where castings up to 4 and 5 tons in weight have been made. They began with horseshoes, using steel with 12 per cent. of manganese; but there was this difficulty. Nails were used with horseshoes, and it was necessary when they projected from the foot of the horse to cut or file them, but if they were made of the same material it was difficult to find a tool that would cut or file them. That led to the use of another kind of material for the nails. An experiment was now being made on a large scale with some cavalry regiments in France. Considerable success had also been obtained in making cast wheels for small mining cars. The difficulty was in drawing the pieces quickly enough from the mold and putting them in water to get the proper temperature. If they were not taken out quickly enough some shrinkage would take place. The most interesting application of the metal was, perhaps, in the direction of armor plating. That, of course, was a difficult matter, because artillery experiments could not be carried out on a reduced scale. Some difficulty also had been experienced from the manganese steel being too high in carbon, and some cracking had taken place in dipping the armor plates in water, but they hoped soon to be able to make a better quality of steel with a reduced amount of carbon. He had explained at a meeting of the Institution of Civil Engineers his views on the influence of carbon on general metallurgy. The cast steel was made with carbon. The Sheffield school, making first-class steel with carbon, might be said to represent the golden age of carbon; but new processes like the Bessemer and the Siemens-Martin had induced persons in enlarging the area of manufacture to try the influence of certain impurities. Carbon appeared to be a very bad companion, and as he had shown in a paper in 1876, phosphorus might remain in steel without much trouble if there was no carbon at all. The same fact had been observed with regard to silicon, and it was now also observed with reference to manganese. The less carbon there was in manganese steel the better it would certainly be. But it was impossible to make manganese steel with, say, 12 per cent. of manganese without having a very high amount of carbon also. Some experiments were now being made with ferromanganese to reduce the percentage of carbon, and they would show whether such a result was practicable.

Louisville Fall Celebration.

The City of Louisville, Ky., was given up to the great Industrial Parade on the 5th inst. Business being entirely suspended, the street cars stopped and the thoroughfares, which were profusely decorated, were literally crowded with visitors and sightseers. The Fall Celebration was handsomely inaugurated, and for the rest of the month festivities and attractions of various kinds will be carried on. The railroads entering Louisville are aiding materially in crowding the city with strangers by giving reduced rates of fare. The parade was one hour and a half in passing a given point, and was headed by Gov. S. B. Buckner and staff and a committee of the Commercial Club. Following came the entire Louisville Fire Department, of which the city is justly proud. Among the attractive floats were displays by the following firms known to the readers of *The Iron Age*: B. T. Avery & Sons had four floats of plows and cultivators, all beautifully finished; on the top of one wagon was a mammoth 40-horse plow. The Southwestern Agricultural Works showed their grain drills, cider presses, corn shellers and feed cutters, and interspersed with the farm implements. Fulton, Conway & Co., showed the products of their hub and spoke factory, having a large wheel 16 feet in diameter, revolving among other wheels. W. B. Belknap & Co., made a very handsome display of their hardware specialties and tools. W. T. Pyne exhibited an engine and corn mill in operation. Stratton & Terstegge and the Bridgeford Company displayed stoves and ranges of all kinds. The Fischer Leaf Company had out enough mantels to furnish several houses. The lumber display was well managed. The Fall Celebration is due entirely to the efforts of the Commercial Club, an organization just one year old, composed of young men, and numbering 687 active members. The result of the Commercial Club has been the infusion of new life to general business and enterprises through the State, of the opening up the mineral and timber lands of Eastern Kentucky, and bringing to the city 45 new manufacturing enterprises, among them some very important ones, such as the Louisville Cotton Mills Company, the Astoria Veneer and Lumber Company, the Gaynor Electric Company, the S. Western Mfg. Company and a number of others.

Johnstown Freight Rates.—The Pennsylvania Railroad Company and the Baltimore and Ohio Railroad Company have restored the old rates on iron and steel from Johnstown, Uniontown, Mount Pleasant, Scottdale and Everson, which are about 10 per cent. higher than those from Pittsburgh to Western points. Some time ago the rates from these points were reduced to the same basis as those from Pittsburgh, but the opposition manifested by the manufacturers of that city was so great that in justice to them the railroad companies restored them. Under the tariff now in force the Pittsburgh manufacturers are not discriminated against in any way.

The Cleveland police authorities have decided to permit no more red flags in that city.

THE WEEK.

Joseph Pool is at the head of an English and American syndicate which proposes to build a railroad across Mexico from Gulf to Ocean, and claims to have obtained a subsidy from the Mexican Government for the purpose. The western terminus, it is declared, will be Tonala, on the Pacific, and the Eastern, San Juan Vautista, on the River Griyalva, about 100 miles from the Gulf. This river is very deep, and will receive vessels drawing 25 feet of water as far inland as the proposed railroad terminus. The length of the road would be 225 miles, and by this line the route to New York would be 800 miles shorter than by the Isthmus of Panama. The necessary capital, it is said, has been obtained, and President Diaz, of Mexico, is said to be actively interested in the scheme. This is the second transcontinental project recently set on foot in Mexico.

The United States Superintendent of Repairs in this city reports to the Supervising Architect of the Treasury Department approving the suggestion first put forth by the New York Produce Exchange that the property bounded by Bowling Green, Whitehall and State streets be bought as a site for the new Appraiser's stores and Custom House. He calculates that $3,000,000 would be a fair valuation for the land thus taken.

The situation in the petroleum markets at this time is more interesting than it has been for several years. There are indications of a combination of big operators to put up the price of crude oil, and the movement of the market in the past few days is taken as evidence that the combine, if there is one, is not without its influence. The big shut-down movement of the Producers' Protective Association expires on the 1st of November, and by that time the stocks will have been reduced from 31,000,000 to 20,000,000 barrels. Besides reducing stocks the work of the Producers' Association has lowered the daily output of the wells from 72,000 barrels to 38,000. It is now proposed to pool the oil and sell it through a committee of trustees, who will also regulate production and restrict the drilling limits.

The transportation lines of steamers on the northern lakes, although reinforced by a large addition of tonnage from the shipyards during the early part of the year, report that the business offered to them during the season thus far is in excess of their capacity. Every freight line, it is said, could have used a larger fleet to advantage The "liners" have not monopolized the lake trade, either. In August one agency at Chicago chartered "tramp" vessels to move over 2,000,000 bushels of grain, and six other agencies arranged for the carrying of about 8,000,000 bushels more. The shipyards are not likely to remain idle. Capt. James Davidson, the Bay City shipbuilder, says: "Whatever the close of the season may be there will be considerable building. The movement toward craft of immense size and high speed seems at an end, and prospective builders favor steamers of 2000 tons or 65,000 bushels capacity, and power to make 12 miles an hour. They seem to think that with the class of freight the lake marine has to carry a higher speed is not economical, and boats that can get around the harbors easily are the most satisfactory."

The third of a fleet of six steel steamships contracted to be built by the Globe Iron Shipyard, at Cleveland, was launched on the 4th inst., and will at once take her place in the Northern Line, between Buffalo and Duluth. She is called the Northern King. Two more steamers of the same line are already on the blocks, and still another goes onto the blocks from which the King was launched. The Northern King is an exact duplicate of the two already finished, being 312 feet over all, 292 feet keel, 40 feet beam, and 24½ feet hold. Her power is also the same, a triple expansion engine, cylinders, 24, 38 and 61 inches, with a 42-inch stroke. Her estimated carrying capacity is 2800, and cost $220,000. Her draft yesterday was 6 feet 7 inches aft and 3 feet 10 inches forward. The fleet is said to have no equal on the lakes.

The crush of baggage at the various railway stations in this city during the past week will be memorable, passing all experience subsequent to the great blizzard. A single train at the Grand Central Depot brought nine carloads of it. At several points the storage capacity was unequal to the demands, and a delay of three days in making a delivery was not unusual.

The greatness of the State of Ohio was a prominent topic in Governor Foraker's address at the opening of the centennial exhibition in Columbus last week. "During this century," he said, "the whole of the 26,000,000 acres of our area has been subjected to the uses of man; more than 17,000,000 of these acres have been put under actual cultivation, with the result of an annual yield of more than 100,000,000 bushels of corn and more than 40,000,000 bushels of wheat, with all other agricultural products which our climate admits in due proportion. We have 600 coal mines, that give us an output of more than 8,000,000 tons of coal annually. We have more than 7000 manufacturing establishments, almost as varied in character as are the wants and purposes of man, in which are invested a capital of more than $200,000,000. In these establishments 250,000 men, women and children find remunerative employment, and from them we have products, fabrics and wares amounting annually to more than $400,000,000, which go out into all the channels of trade and commerce, to literally gather from the ends of the earth rich rewards for the labor, skill and ingenuity of our mechanics and artisans, and add to the fame and name of a progressive and enterprising people. We have, in short, where there was nothing a century ago, a grand aggregate of nearly 4,000,000 of people and five thousand millions of wealth. We stand as a State in the front rank with the greatest States of the great American Union."

All the wooden culverts and short bridges on the Delaware, Lackawanna and Western Railroad are being replaced with subtantial iron structures. There are but few of the original wooden bridges left.

The now venerable Dr. Joseph Francis, inventor of the metallic lifeboat and other life-saving appliances, is now 86 years old. A few days ago Congress awarded him a gold medal with a suitable inscription, to be presented by the President of the United States "in recognition of his eminent services." Emperor Napoleon, before whom he gave a special exhibition of his life-car, knighted him and gave him a gold snuff-box. The box was studded with 86 diamonds. The Emperor of Russia created him a knight of St. Stanislaus, and when he returned home he found that his life-car and pontoon wagons for naval and military purposes had been adopted by this Government

New Orleans is expecting to become a great lumber port, now that railways give it a better connection with the Yazoo delta, of Mississippi, the future field of hardwood lumber production. It is the port also of the pine country along Lake Pontchartrain and the line of the Illinois Central, and of the great pine region lying along both banks of the Red, and finally of the cypress forests of the Mississippi and Atchafalaya. It will thus be seen that all the leading varities of lumber meet there, pine from half a dozen sections, cypress and the varied valuable woods of the Yazoo delta.

The Louisiana sugar crop of the last year was the largest since the war, and exceedingly lucrative. The production amounted to 285,000 hogsheads, an increase of 139,000 over the previous year, and the yield of molasses was nearly 22,000,000 gallons. The coming year promises a still larger increase.

Bernard Gallagher, a well-known local contractor, has been awarded the contract for completing the new Federal building in Brooklyn at his bid of $860,000.

There are 4000 acres of mud flats in front of Jersey city and Bayonne which it is proposed to utilize by building a series of wet piers, with channels between them of sufficient depth for the passage of large vessels. A Legislative committee of the State of New Jersey regard this plan as feasible.

The heavy shipments of wheat from California to France are regarded as a sure indication that Europe will require much larger supplies from America than it did last year. Already this season the exports from San Francisco to France exceed by more than 50 per cent. those to Great Britain, whereas in the last harvest year to date France took no wheat from that port.

A syndicate of New Yorkers and Europeans, headed by H. B. Hollins & Co., represented by H. M. De Thysebaert, and Robert Colgate, represented by M. L. Guiraud, have signed a contract with the Mortgage Bank, of Mexico, whose charter was granted by the Mexican Government, in 1882, previous to that of the National Bank of Mexico. The principal condition of the agreement with the bank was the granting by the Government of certain modifications to the charter, so as to enable the bank to carry on a general banking business and issue certificates of deposit in silver and gold, in dollars, payable in the Republic or abroad. The combination has for its object the uniting of the silver production of Mexico with that of the United States, so as to make the silver market in New York instead of London. It is stated at Mexico that Mr. Jordan, of the Western National Bank, New York, is the moving spirit in the enterprise.

The Mallory line of steamships to Florida has been temporarily withdrawn because intermediate Southern ports are closed against infection from Jacksonville.

The official crop report of Russia is favorable. According to the reports received by the Ministry of the Interior up to August 16, the harvest of winter wheat in European Russia is now almost completely gathered, the yield, except in a few districts, being satisfactory, or at least an average one. The condition of the summer crops is generally good. In the Governments of Moscow, Smolensk, Kaluga, Pensa, Orel and Nijni-Novgorod the hemp seed and peas were first injured by insects, which, however, disappeared with the cool weather which subsequently set in. The damage caused in July by hail, from the effects of which the Governments of Poltava, Kursk and Kielce suffered most, is estimated altogether at about 3,000,000 roubles.

The so-called "jute bagging trust" excites unusual commotion at all the cotton-trade centers in the Southern States. The feeling thus aroused against alleged extortion is being turned to advantage for the encouragement of local industries. At New Orleans cotton planters are introduc-

ing what is called "osnabergs" of a heavy quality as a substitute for jute bagging, and in South Carolina a species of pine straw bagging is in high favor, after experiments to show that it is not only durable, but as well adapted as any other to resist the danger from fire. The National Board of Marine Underwriters decide that no discrimination will be made by them against cotton covered with any light-weight, close-woven material of reasonable strength.

There seems to be no real ground for the discussion which has arisen respecting the nationality of the soil upon which the St. Clair Canal was built, although it is conceded that had there been a slight error in its location Canada might well have disputed the title. A special dispatch to Detroit says: "Major Lydecker, formerly of Detroit, who was captain under General Cram, the engineer who had charge of the surveying of the line for the St. Clair Flats Canal, and David Enright, now topographer of the Post Office Department, who was engaged in the office with General Cram during the construction of the canal, are both thoroughly familiar with it. Mr. Enright said there is not the least doubt that St. Clair Flats Canal is in American waters. When the appropriation was originally granted a survey of the proposed canal was made by Captain Lydecker. This was the original survey, and established the axis or center line of the canal. When the canal was opened for traffic the Canadians gave out exultingly that the canal was in Canadian waters. This was 20 years ago. The Canadian newspapers having paid much attention to this matter, an order was sent to General Cram, the engineer in charge of the work, by General Humphrey, then chief of the engineers, directing him to resurvey the axis line, and a second time Lydecker established it by a very accurate survey of triangulation."

The annual statement of the Controller of the city of Philadelphia shows that the increase in property valuations during the year has been $22,261,425, and there is an aggregate of over $25,000,000 in the sinking fund toward the extinguishment of a debt of $57,826,495. The Controller calculates that the present tax rate—$1.85 on the $100—will yield next year $386,237.49 in excess of the amount which the same rate will yield in 1888.

The Canadian Pacific Company expect to have their extension across the State of Maine so nearly completed by the latter part of September that by using the track of another road a portion of the distance they can carry freight to and from St. Johns, N. B., thus coming in direct competition with the Intercolonial Railway, and also with other railways of Maine.

An action brought against the owners of grain elevators in this city will soon be brought to trial, to test the constitutionality of the new law regulating the charges for handling grain, which, it is said, is successfully evaded. The elevators, it is alleged, charge an excess of ½ cent per bushel. When it was proposed to regulate and lower the price of direct transfers at the two ends of the canal it was shown by competent witnesses that if the reduction was made and maintained it would mean a vast increase in the volume of business, but for some reason it has not been enforced, and the State of New York and the people suffer in consequence, while the railroads prosper accordingly. One result is that much of the grain goes from the West through Canada to Europe, being forced outside of the State.

The New York, New Haven and Hartford Railroad Company have discontinued building their own engines and cars, as the shops are taxed to their utmost making necessary repairs to the rolling stock.

MANUFACTURING.

Iron and Steel.

William Grover, Rookery Building, Chicago, whose iron tank works are at East Chicago, has recently found his business accumulationg so rapidly that he will be forced to extend his facilities. When his contemplated improvements are completed the works will have double their present capacity. His specialty is the manufacture of tanks to hold oil for fuel.

Ground will shortly be broken at East Chicago for the erection of a large car-wheel works. A plant is also to be built in the same locality for the manufacture of dump cars, stationary engines, &c. The names of the projectors are not yet announced, owing to the necessary settlement of some preliminaries, but definite arrangements have been made for the erection of both works

The Union Steel Nail Company, of Omaha, Neb., have been offered a bonus of $50,000 cash and four blocks of ground to remove their works to St. Joseph, Mo., It is understood that the offer has been accepted and arrangements made for the removal and re-erection of the plant, which is estimated to require about 90 days.

All departments of the plant of the Central Iron and Steel Company, of Brazil, Ind., started up in full on the 23d ult. with excellent prospects for a steady run.

The Brier Hill Iron and Coal Company, of Youngstown, Ohio, have purchased the old Eagle Furnace, formerly operated by the Eagle Iron Company, at Oreton, and will dismantle it. Part of the furnace will be removed to Brier Hill, and be erected there, and the remainder will be sold for scrap. It was one of the first furnaces erected in the Mahoning Valley, being built in 1846, by David Morris, Jonathan Warner, Harvey Sawyer and William Philpot. It has been idle since 1883. The above firm have just closed a contract with McClure & Schuler, engineers and contractors, of Pittsburgh, for the erection of a plant of the Massicks & Crooks patent fire-brick stoves for their Tod furnace. This is a new departure for the Mahoning Valley, being the first fire-brick stoves erected in the valley.

All departments of the works of the Belmont Nail Company, of Wheeling, W. Va., are being operated to their utmost capacity. The blast furnace of this company produced 3300 tons of Bessemer pig iron for the month of August, just closed.

Negotiations for the lease of the Laclede Rolling Mills are still in progress. Mr. Wilcox, president of the Western Steel Company, is reported as having made offers to take the works, and Colonel McNair, of the Missouri Furnace Company, has also been named in the same connection as a party in interest. The former operators of the works, the Laclede Plate and Sheet Mill Company, or at any rate Mr. Paddock, the president of that company, have also been negotiating to secure another lease of the works. We understand that a proposition has been submitted to Mr. Paddack by the Laclede owners and is now being considered by him.—*Age of Steel, St. Louis.*

It is proposed to build two 75-ton furnaces at Radford, Va., and Mr. George T. Mills, who is at the head of the enterprise, reports that $270,000 have been subscribed, leaving only $30,000 to be raised.

The syndicate of creditors who recently purchased the rolling mill plant of Graff, Bennett & Co., at Pittsburgh, are making preparations to put the Clinton Blast Furnace, which is located on the south side, in operation. After the furnace has been started up and a stock of pig iron secured, the rolling mill will be put in operation. If the syndicate finds they are successful in running this plant the Clinton Rolling Mill will also be put in operation. All the old employees will be given employment if they are good workmen. The plant will be run by the same persons practically as it was when operated by Graff, Bennett & Co. The capacity of the Clinton Furnace is about 16,000 net tons of pig iron annually. It was built in 1859, and supplied the pig iron for use in the puddling furnaces of the mill. The mill was erected in 1846 and is one of the oldest in the country. It has 7 double and 19 single puddling furnaces, 11 heating furnaces, 6 trains of rolls, 42 nail machines and a plate mill.

A charter has been granted to the Boies Steel Wheel Company, of Scranton, Pa. The capital stock is $500,000.

A new manufacturing corporation has been organized at Pittsburgh, under the name of the Hainsworth Steel Company, with a capital stock of $500,000, and application for a charter will be made on the 26th inst. Those named in the application as members of the new corporation are William G. Johnston, John Irwin, Jr., Charles Bailey, Thomas C. Lazear, Stewart Johnston and William Lyon, all of whom are at present connected with the Pittsburgh Steel Casting Company. It is also stated that the company will include others equally as prominent in manufacturing circles. The object of the new company is to manufacture rolled cast-steel car-wheels by the new process, and under patents granted to Mr. Wm. Hainsworth, who has been superintendent of the Pittsburgh Steel Casting Company for many years and who will also act in the same capacity with the new concern.

Alice Furnace No. 1, of the Etna Iron Works, Ironton, Ohio, has been blown out for repairs. Blanche, of this company, which has been in course of erection for the past year, will be ready for operations about October 15th next.

Some time ago we made mention of the fact that the plant of the Wheatland Iron Company, at Wheatland, Pa., owned by the Woods heirs, of Pittsburgh, would shortly be put in operation, after an idleness of more than ten years. The new hydraulic machinery which has been in course of erection in the works for several months past, for the manufacture of skelp iron of large sizes, has been completed, and is now undergoing the preliminary tests. It has worked most satisfactory in every particular, and with the utmost smoothness and regularity. The principal part of this machinery is two large hydraulic tables, on either side of the three-high train of rolls. Each table is 50 feet and 3 inches long, and weighs over 22 tons. Each has a side motion of several feet, over which it travels at the will of the engineer, from one set of rolls to another, a perpendicular motion by which the iron is raised from the lower to the upper rolls, or *vice versa*, while the surface of the table is composed of a number of iron rolls, turning to or from the large rolls, for receiving or delivering the iron into them. All these motions are operated entirely by hydraulic power, furnished by powerful pumps, at a pressure of from 100 to 140 pounds to the square inch, and can be put in motion singly, doubly or all together, and stopped, started or reversed instantly at the will of the engineer. Mr. Mattock, of Pittsburgh, the hydraulic engineer who designed and built it, estimates that with three men and three boys it will easily handle 300 tons of iron every 24 hours; that ordinary mills handling the same quantity and kind of iron require 30 men or more on each "turn," a very material saving in labor. Mr. T. S. B. Wood,

of the Wheatland Iron Company, who has given the remodeling of the mill his personal supervision for the past year or more, expects to have the mill in operation and making iron within 10 days or two weeks.

Announcement is made that the prow for the United States cruiser, weighing 12,000 pounds, was successfully cast at the Union Iron Works, San Francisco, a few days ago.

The blast furnace of the Charlotte Furnace Company, Limited, at Scottdale, Pa., manufacturers of pig iron, was put in blast on the morning of the 5th inst., after a stoppage of eight months, caused by labor troubles. In giving employment to the workmen no discrimination was exercised against members of any labor organization, and the force of men at work comprise a large number of the former employees of the company.

In answer to a report that the workmen in the employ of the Cherry Valley Iron Works, of Leetonia, Ohio, have gone out on a strike, we received the following advice from the company under date of the 4th inst.: "Last week our men (the top and bottom fillers and cinder men only) made a demand of 10 per cent. increase in wages. This we refused to give because we have always been governed by the wages paid in the Mahoning Valley, always paying the same as they do. The men were out two days when they frankly acknowledged being wrong in their demand, and asked to be restored to their positions. This we did, and the blast furnace started up on the morning of the 3d inst. at the old wages."

The New Castle Wire Nail Company, New Castle, Pa., have decided to erect a new wire-rod mill in connection with their works. The mill will be 1000 feet long, and will occupy several acres.

The Bessemer department of the Bellaire Nail Works, of Bellaire, Ohio, produced 6500 tons of steel during the month of August last, while during the same period the blast furnace produced 3964 tons of Bessemer iron. All departments of the works are in full operation with the exception of the nail factory.

The nail factory of the La Belle Iron Works, at Wheeling, W. Va., which has been idle for some time, resumed operations on Tuesday, the 4th inst. All departments of the company's plant are now in full operation.

Riter & Conley, of Pittsburgh, were successful on the 4th inst. in securing the contract for the Twelfth street viaduct in Chicago. The bids were as follows: Chicago Forge and Bolt Company, $121,558; A. Gottlieb & Co., $118,678; Detroit Bridge and Iron Works, $112,020; Riter & Conley, $109,348. The work is to be completed by April 1, 1889, under penalty of $50 for every day beyond that date. The length of this viaduct is about two city blocks, and its width is 58 feet 3 inches. It will have two roadways and two sidewalks. It begins at the east line of Clark street, crossing the Chicago, Santa Fé and California and the Chicago and Western Indiana railroads.

The Viaduct Iron Mills, at Coatesville, Pa., which have been idle for seven months, have resumed operations. They were recently purchased at sheriff's sale by Worth brothers, who have other large iron mills at Coatesville. It is understood a new company being formed will also start up the Laurel Iron Works soon.

Machinery.

Dennison & Hamilton, 144 and 146 Lake street, Chicago, have purchased the Wilcox patent stove-pipe groover, and will hereafter manufacture it. This machine can be attached to any tinners' hollow mandrel, and, when not in use, can be shoved back to the bench. With it a strong boy can groove 400 joints of pipe an hour and produce better results than an experienced man using the old style method. The machine can also be used in making large tin and galvanized-iron conductors. It is easy of action and is operated with an entire absence of the noise produced by the hand groover and mallet.

The Hughes Steam Pump Company, of Cleveland, Ohio, have just made a large export shipment of pumps through their New York Agents, Messrs. Donegan & Swift.

The works of W. P. Davis, of North Bloomfield, N. Y., builder of machine tools, were closed for a vacation on September 5, and will not be reopened before the 19th inst.

The Cooke Locomotive Works are about to be moved from the present site near Passaic Falls, in Paterson, N. J., to a more convenient location inside the city limits, but having spur tracks from the Delaware, Lackawanna and Western and the New York, Lake Erie and Western. The inconvenience of having to team all material as well as the finished locomotives through the streets is so great that it is surprising that the three locomotive-building firms at Paterson should still continue in such an inconvenient location. The new Cooke works will be carefully laid out and arranged on the most convenient plan that experience can suggest.

The Westinghouse Electric Company, of Pittsburgh, have in preparation a series of street car tests for the new Tesla motor. The motor has been reduced to convenient form for storing away in street cars, and several tests have already been made showing its adaptability to street work. The final trials now being arranged for will be of the severest nature. After they are over, if they prove successful, the motors will be put on the market. It is thought that one or two of Pittsburgh's street lines will adopt them if the tests are successful.

The Standard Underground Cable Company, of Pittsburgh, have received an order from the United Electric Light Company, of Springfield, Ohio, for two miles of cable, which will be used to extend the plant of the latter company.

A press dispatch from Wheeling, W. Va., under date of the 7th inst., says: "The Baltimore and Ohio Railroad Company, through their resident counsel, this evening announced to the Council Committee on Railroads that the company had their plans all arranged for the erection of a 32-stall round house, machine shops, not less than 120 feet square, and car shops, construction shops, blacksmith shops, paint shops and other buildings of proportionate size, work to be commenced at once. It was announced upon the authority of General Manager W. M. Clements that these buildings had been originally intended for the Philadelphia Division, but that the company had changed their plans.

During July and August of this year the Babcock & Wilcox Company, of New York, sold boilers amounting in all to 13,162 horse-power.

Among the late shipments of the Dwight Slate Company, Hartford, are ten fine bench lathes intended to make adjusting screws for the Edison phonograph, requiring 100 threads to the inch. Mr. Slate has invented a semi-automatic pinion cutter for small pinions, the index being worked by the reverse motion of the lever.

The Billings & Spencer Company, Hartford, are making a new style seal press for the Keystone Seal and Press Company, New York. It is intended to take the place of the crude machines now in use, and is being adopted by the railroads to detect the opening of cars *en route*. The W. A. Wood Mower and Reaper Company, Hoosac Falls, N. Y., have just placed an order with them for 40,000 Pitman eyes, weighing over a pound each.

The Chase Turbine Mfg. Company, at Orange, Mass., will shortly occupy their new foundry, which is now about completed.

The Farrel Foundry and Machine Company, Ansonia, Conn., are at work upon the foundations of a new shop 100 x 250, which, when completed, will be used for a foundry. It is to be situated at the north end of their present shop.

Hardware.

The New Castle Wire Nail Company, of New Castle, Pa., are at present considering the question of erecting a steel wire rod mill adjacent to their present works. The company draw their own wire, but on account of difficulty in procuring rods as fast as needed they have about concluded to build a rod mill.

The McCosh Iron and Steel Company, at Burlington, Iowa, are reported to be running their wire nail department full time, and will soon start up their barbed wire works, which have recently been closed down for repairs. They have put in additional engine and boiler capacity with a view of having sufficient power to operate a wire-drawing plant of their own, which they contemplate putting in at some future date should the market price of wire advance too freely.

The works of the Hermann-Parker Hardware Mfg. Company, on Twelfth street, St. Louis, will be dismantled. The lease on which they stand will expire soon, and it is impossible to sell the plant as a whole to any advantage.

R. Wallace & Sons Mfg. Company, Wallingford, Conn., have recently added a new building to their plant, put in new boilers, and in other ways increased the capacity of their factory.

Miscellaneous.

G. W. M. Reed, G. H. Rosseet and J. W. Cotton have secured a charter from the State of Illinois for the United States Cold Bending and Coiling Pipe Company, of Chicago. The authorized capital is $250,000.

The Youngstown Stamping Company, of Youngstown, Ohio, manufacturers of stamped and tinware, have leased a glass plant in the above-named city and will put it in operation as soon as repairs and new improvements can be made. The company use a large amount of glass jars in making oil cans and other specialties they manufacture, and find they can manufacture this glassware much cheaper than it can be bought from dealers.

The organization of the Novelty Steel Wheel Company, with a capital of $500,000, has been completed in Pittsburgh. It is proposed to go into the manufacture of steel vehicle-wheels, the invention of Dr. A. C. Hall. Interested in the company are Geo. W. Everson, late of the Scottdale Iron Works. A plant costing $100,000 will be erected in Little Washington immediately, having a capacity of 30,000 wheels yearly, or 100 sets per day. It will afford employment to 200 men. One buggy manufacturer has submitted an offer to purchase the entire output for a year.

The Tanner Anti-Friction Wheel Company have been chartered at Chicago with a capital of $500,000. The incorporators are Warren G. Purdy, Frederick W. Porter, Samuel W. Tanner, Frank L. Strong and George H. Fergus.

The Iron Age

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DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

Protection and Progress.

In our recent article on this subject we advanced the proposition that the protection against unrestricted competition afforded by the patent laws and the tariff operated directly to encourage that free interchange of ideas which is the secret of progress. And we think it not difficult to show that the tariff, in particular, may effect in this way a benefit for the whole civilized world, in comparison with which all the arguments, pro and con, as to its other economic effects become relatively insignificant.

The history of the Bessemer manufacture affords a striking illustration. This industry is the favorite theme of those who denounce the protective tariff as the creator of odious monopolies. We hear abundantly of the vast sums which the Bessemer manufacturers have taken from the helpless consumers to enrich themselves. It is not our purpose now to argue that proposition; but we must say, in passing, that the history of the Bessemer business in the United States is by no means the history of a pampered favorite, secured by a sovereign grant in the enjoyment of a sinecure. Whoever will inquire into the struggles, perplexities, losses and failures of its pioneers in this country will confess that they paid dearly for the prosperity of some of their successors. Moreover, it was essentially the patent monoply, rather than the tariff, that protected them. If there had been no tariff at all, a still completer protection might have been secured (as it frequently is, in similar cases) by an agreement with the owners of the Bessemer patents abroad, giving to the American licensees the exclusive possession of this field.

But what we wish to consider at present is the effect upon progress, both here and abroad, produced by the establishment of the Bessemer manufacture in this country. Without disparagement of the enterprise conducted at Wyandotte, where the first American Bessemer steel was made in 1864, it may be said that the business fairly began with the building of the works at Troy by the late A. L. Holley. Mr. Robert W. Hunt, himself at one time superintendent of the Wyandotte works, declares, in his "History of the Bessemer Manufacture in America," that the Troy establishment was the first to bring the process near to a commercial success. How many times it came near, even in Holley's hands, to commercial ruin, those to whom he confided his troubles and anxieties know well enough. Mr. Hunt's admirable historical sketch, just mentioned, will be found in the Transactions of the Institute of Mining Engineers, Vol. v. p. 201. It presents a vivid picture of the small and perilous beginnings of this great enterprise, and offers a noble tribute to the courage and genius which finally achieved a triumph. The following paragraph contains in a nutshell the moral of the story:

I must here state that, after building the first experimental plant at Troy, Mr. Holley seems to have at once broken loose from the restraints of his foreign experience, and to have been impressed with the capabilities of the new process. The result is that, mainly through his inventions and modifications of the plant, we in America are to-day enabled to stand at the head of the world in respect of amount of product.

It is not necessary to describe in detail the successive steps by which this result was accomplished, and in which Holley was nobly assisted by Hunt, Fritz, Jones and others. The result itself is what we wish to emphasize, and this is shown most forcibly by a few figures, representing the productive capacity, at various periods, of a two-converter Bessemer plant. Twenty years ago the capacity of the Troy works was claimed to be 40 tons of ingots per day, but this was only the ideal aimed at. It had never been realized. It was in 1868 that Holley proudly announced that his dream of 40 tons per day had been made true at the Harrisburg works. Eight years later, in 1876, Mr. Hunt reported the best achievements of various American Bessemer works up to that time, as follows:

	One day.	One week.	One month.
Pennsylvania.	281	1291	5455
Troy	297	1475	6051
North Chicago	330¼	1583	6457
Joliet	350	1528	5367
Edgar Thomson	265	....	5403

But the climax was not reached, even by these extraordinary achievements. We can scarcely venture to-day to state the best work performed by two converters, lest we might do injustice to some establishment which had already surpassed it. But if we take as an example the reported operations of the Union Steel Company, of Chicago, in May last, when, in 50 12-hour turns, 28,145 gross tons of ingots were made—a product nearly five times as great as the best of 1876, which was itself more than five times the best of 1868—we show sufficiently what American genius has done with the Bessemer process. It should be added, however, that this vast quantity of ingots was simultaneously rolled, making, for one month, 24,953 tons of blooms and 22,808 tons of rails.

The commercial result in the United States of these and kindred improvements has been to reduce the price of steel rails from $167 to less than $30 per ton. The effect abroad has been equally remarkable. In 1868 the announcement of 40 tons as the daily capacity of two converters was received in England with incredulity. Five years later the reports from American works were similarly disbelieved. But facts were too strong to be resisted. Holley, Wm. R. Jones and others put their figures freely before the British Iron and Steel Institute, and the foreign ironmasters were made welcome at American works. The result was the gradual adoption of American designs and methods everywhere. At each step of our advance the same phenomena repeated themselves; disbelief, reluctant admission, eager imitation. It is not too much to say that in this manufacture Americans have dragged the world after them. That steel rails are to-day cheaper than iron ones is a boon which the English or European consumer, quite as truly as the American, owes to Holley and his colleagues.

The cheapening of transportation thus effected has revolutionized the relations of agriculture. This it is that has made possible the sending of wheat from Dakota to Liverpool. But we need not undertake to review the wide effects of the Bessemer manufacture. They are admitted by all—even by those who seem not to be aware that Americans chiefly brought about the grand result; that they would not have undertaken it at all without protection against foreign competition, and that being so protected they freely communicated to the world their plans and operations, to the unspeakable advantage of all.

The Blast Furnaces on September 1.

During the month of August there has been quite a notable addition to the furnace capacity actively at work, the improvement being confined almost exclusively to the coke furnaces. In the aggregate the figures show the following:

	Anth.	Coke.	Charc'l.	Total.
Aug. 1, 1887....	37,930	62,091	11,533	111,554
Sept. 1, 1887....	38,338	83,124	11,505	132,967
Aug. 1, 1888....	33,397	74,855	11,137	119,289
Sept. 1, 1888....	33,541	81,082	11,243	125,966

While we have not reached the totals of last year, it is probable that within the current month, and certainly in October, the coke furnaces will go up to 83,000 tons. From the present outlook, however, little progress is expected in anthracite pig iron.

The status of the anthracite furnaces was as follows on the 1st of September:

Anthracite Furnaces in Blast September 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York	26	8	2,755	18	4,135
New Jersey	15	3	948	12	3,844
Spiegel	3	3	219	0	0
Pennsylvania:					
Schuylkill Valley.	35	16	5,072	19	3,821
Lehigh Valley	46	27	9,892	19	4,490
Spiegel	1	1	45	0	0
L. Susquehanna Valley	23	12	5,162	11	2,642
Lebanon Valley	15	14	6,825	1	400
U. Susquehanna Valley	18	8	2,713	10	1,880
Maryland	4	0	0	4	462
Total	186	92	33,541	94	21,674

Again, there has been a slight increase in the capacity blowing, although the large figures of last year have not been reached. We do not hear of any marked movement to increase the number of active plants running on anthracite, as a fuel. For a year past our records show the following figures:

	Furnaces in blast.	Capacity per week.
September 1, 1888	92	33,541
August 1	93	33,397
July 1	92	32,478
June 1	99	32,418
May 1	96	31,006
April 1	94	30,496
March 1	98	28,598
February 1	97	29,989
January 1	118	38,206
December 1, 1887	122	39,487
November 1	124	40,028
October 1	123	39,440
September 1	125	38,338
August 1	120	37,930
July 1	138	40,742

In New Jersey, Secaucus is out, leaving only Oxford, Franklin and Warren at work, with Chester Furnace still banked. In the Schuylkill Valley there have been no changes during August. No. 1 Phœnix was off three weeks with a chilled hearth,

but had recovered and is again running regularly. Warwick was obliged to stop for 13 hours on the 22d ult., on account of the high water in the Schuylkill River, which covered the cast house to a depth of 2 feet. Norway has begun to reline and may blow in during October, although it is probable that it will be later. In the Lehigh Valley one of the Coplay furnaces resumed, but, on the other hand, one of the Crane stacks went out. A new hot-blast stove is being added to the equipment of the spiegel furnace of the Lehigh Zinc Company. The product of the furnaces working has been 44,210 in August. In the Upper Susquehanna Valley the Pennsylvania Steel Company are taking down one of their plants, leaving four at work, which have, however, made a very heavy product in August, so that the total of the district was 21,300 gross tons. Katherine blew in on the 29th ult. In the Lebanon Valley the same furnaces are running, their August product being 29,578 tons, of which 20,946 tons were made by seven furnaces, the largest producer of all being the Robesonia. In the Upper Susquehanna Valley the same eight stacks which have been at work for months past made 12,013 tons in August, as compared with 11,529 tons in July. The reports from the furnace companies do not indicate any tendency toward resumption among the idle plants—in fact, some of the companies which blew out during the depression state directly that as yet they do not see enough encouragement to warrant a return to work. What changes there have been and are contemplated are merely brought about by the completion of repairs in progress.

The position of the coke furnaces was as follows on the first of this month:

Bituminous and Coke Furnaces in Blast September 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week. Gross tons.	Number out of blast.	Capacity per week. Gross tons.
New York	3	2	1,864	1	900
Pennsylvania:					
Pittsburgh district	19	15	15,865	4	2,801
Spiegel	1	1	371	0	0
Shenango Valley	19	13	8,029	6	3,896
Juniata and Conemaugh Valley	21	12	5,807	9	3,340
Spiegel	1	0	0	1	200
Youghi. Valley	5	3	1,172	2	976
Miscellaneous	3	2	1,093	1	650
Maryland	2	1	250	1	120
Ohio:					
Mahoning Valley	14	11	7,446	3	2,150
Hanging Rock	11	8	1,899	3	594
Hocking Valley	14	4	1,133	10	2,194
Central and Northern	17	13	9,133	4	1,716
West Virginia	6	3	1,751	3	1,063
Illinois	13	9	9,914	4	3,120
Wisconsin	4	1	497	3	2,011
Michigan	1	0	0	1	250
Missouri	6	1	436	5	2,135
Indiana	2	1	174	1	240
Colorado	1	1	462	0	0
The South:					
Virginia	11	8	3,681	3	1,853
Kentucky	4	4	991	0	0
Alabama	17	12	6,210	5	2,090
Tennessee	10	7	2,889	3	1,137
Georgia	2	1	486	1	259
Total	217	133	81,082	74	33,895

	No. of furnaces.	Capacity per week.
September 1, 1888	133	81,082
August 1	122	74,355
July 1	121	69,543
June 1	128	75,427
May 1	130	75,815
April 1	128	70,644
March 1	128	68,892
February 1	136	73,912
January 1, 1888	143	83,101
December 1, 1887	144	88,835
November 1	151	90,459
October 1	152	89,123
September 1	145	83,124
August 1	113	62,091

It will be observed that there was an increase in the capacity blowing of over 6000 tons per week. In this New York, the Shenango Valley, Illinois, and notably the Wheeling district participated, while the South, the Pittsburgh district and the Mahoning Valley remained stationary.

In the Pittsburgh district Clinton Furnace, of Graff, Bennett & Co., which has been idle since the failure of that firm, will be put in blast during the present month by the syndicate of creditors who recently purchased the plant. Edith will not be ready for blast before next month. It is being relined and otherwise repaired. Lucy No. 2 was blown out on August 16 for relining and will not be ready for operations before the latter part of October. Soho is almost ready to resume and may go in this month.

In the Shenango Valley Keel Ridge blew in on the 16th ult., and one of the Sharon Iron Company's furnaces was added to the active list during the month. Rosena is to become a producer in a short time. Neshannock, with its increased equipment, made a large product during August, putting it into the ranks of the largest producers in the country. The total output of the valley was 33,883 gross tons for August. In the Juniata and Conemaugh valleys the active capacity was reduced by only one small plant, the August output footing up to 25,273 tons. In the Youghiogheny Valley Charlotte has lately blown in, and Rebecca is soon to resume operations. Centre Furnace is again in blast. During its stoppage eight new boilers have been added to the plant. There is great activity in the Mahoning Valley, where the August product was 32,534 gross tons. A number of the producers report to us that the demand is very heavy, one of them writing: "Never in our 20 years' experience have we had such a demand for our iron. We stopped selling a month ago, and yet our order book is getting ahead of us by merely trying to take care of our customers." We may state that the company quoted make a specialty of foundry irons and of American Scotch. From the Hanging Rock region, the owners of the Eliza report that they expect to discontinue iron making after October 1st, when the present stock will be used, until prices improve materially. Star is banked for repairs, which it is expected will be completed by the 20th inst. Tropic, as already reported, blew in on the 20th ult. In the Hocking Valley Crafts is soon to smelt, and Fannie is to follow in a few weeks. The only item worthy of mention in connection with the furnaces of Central and Northern Ohio is that Emma started on the 30th ult. In West Virginia Riverside has resumed, and Top Mill which is being relined is expected to resume by the beginning of next month. Illinois is again coming up. Chicago Furnace blew in on the 1st inst., and three of the South Chicago furnaces are at work, with their aggregate capacity of over 4000 tons a week. Union is running three stacks. In Wisconsin Mayville was compelled to blow out on the 16th ult., on account of the bad condition of the bosh wall. It is expected to be in operation again on the 1st of October.

For convenience sake we have grouped together those States usually known in the iron trade as the South. We have not included West Virginia, because practically the furnaces of Wheeling form a district of their own with a number of the Ohio plants. In Alabama one of the Sheffield and Birmingham Company's furnaces chilled soon after blowing in, and the Sheffield furnace is idle. Bibb, one De-Bardeleben, two Eureka, Mary Pratt, Pioneer, one Sloss, two Alice, two Ensley and one Woodward are running. Williamson is out for repairs. The second De Bardeleben is to be blown in by the end of October. Gadsden and one of the new Sloss furnaces are to go in this month. In Georgia Cherokee is to be relined, and a new hearth is to be put in.

Charcoal Furnaces in Blast September 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England	14	8	605	6	495
New York	10	3	390	7	565
Pennsylvania	23	4	350	19	724
Maryland	13	3	340	10	580
Virginia	23	4	153	19	790
West Virginia	3	0	0	3	165
Ohio	18	8	560	10	695
Kentucky	3	3	270	0	0
North Carolina	2	1	90	1	80
Tennessee	10	5	1,220	5	1,130
Georgia	2	0	0	2	114
Alabama	10	7	1,290	3	708
Michigan	25	12	3,499	13	2,360
Minnesota	1	0	0	1	190
Missouri	4	2	623	2	320
Wisconsin	11	5	1,353	6	680
Texas	1	0	0	1	178
California	1	0	0	1	230
Washington Ter.	1	1	390	0	0
Oregon	1	1	270	0	0
Total Sept. 1	176	67	11,243	109	10,004
Total Aug. 1	176	65	11,137	111	10,095

In New England Kent Furnace began operations toward the close of last month. In New York Copake is out. In Virginia Walton was just filling in on the 1st and has begun work. In the Hanging Rock region Jefferson ran only a part of the month. Mount Vernon lost two weeks in August putting in a new hearth, and Olive is temporarily idle for repairs, to be followed by a regular run. Vesuvius produced during the greater part of the month. In Michigan the Detroit and Elk Rapids went out, the latter on the 23d ult. Fayette lost five days through an explosion on the 19th ult.; still the total product of the State for the month was 16,526 tons. One of the Eureka furnaces blew in on the 25th ult. In Wisconsin Hinkle furnace at Ashland resumed on the 22d ult. In the South the only change is that Tecumseh is out for repairs. Rock Run has stopped since the 1st to put in a new hearth and make general repairs. From the Northwest notably come reports that the furnaces are sold up to the close of the present year and beyond that time.

Hardly a day passes but witnesses an attack in the daily press upon the steel rail combination. Classing them among the worst of the iniquitous "trusts," these writers tell the public that the mills have combined under the shadow of an outrageously high duty to rob the country annually of untold millions. The remedy, of course, lies in reducing the tariff, and with that object in view absurd misrepresentations, like Scott's statement of cost of manufacture, are kept going persistently. It is argued that the "steel barons," secure from the intrusion of foreign makers, have killed competition at home, and that the English or German rail maker is the only one who can save an afflicted consumer. The steel rail manu-

facture is the pet example of those who hold the views to which President Cleveland has again given expression in the letter of acceptance just published, in these words: "We believe that these trusts are the natural offspring of a market artificially restricted; that an inordinately high tariff, besides furnishing the temptation for their existence, enlarges the limit within which they may operate against the people, and thus increases the extent of their power for wrongdoing. With an unalterable hatred of all such schemes, we count the checking of their baleful operations among the good results promised by revenue reform." It has always been amusing to those familiar with the history of the foreign iron trade to have steel rails quoted as an example of the alleged close relation existing between trusts and protection. For years the steel rail manufacturers of England and Belgium, both free trade countries, and of Germany, which has a moderate protective tariff—for years makers of these three countries worked under an international syndicate which parceled out the world's markets between them. Now, almost on the day on which the President's letter was published, comes the news that this international association has been once more organized. It is reported that not alone have all the makers of England, Belgium and Germany joined it, but that this time the French works are in the trust. What an added temptation to harmony would be the possession of even a part of the markets of the United States, with their consumption equal at times to that of the rest of the world taken together!

Elasticity of the American Iron Trade.

While the alternate "booms" and depressions in our domestic iron trade are regarded with much solicitude by political economists, some of whom fancy that to correct such irregularities an easy remedy exists in the abolition of tariff duties, yet the manner in which the trade accommodates itself to these varying conditions challenges admiration. The rapidity with which the United States has advanced in the manufacture and consumption of iron and steel, until it now practically occupies first place among the nations of the world, is one of the marvels of the century. It would have been better for all interested if this advance could have been made gradually, each year showing an increase as compared with its predecessor, instead of moving fitfully as it did, sometimes taking leaps and bounds and at others halting, if not retrograding.

Taking the production of pig iron, for instance, to go back no further than eight years, remarkable fluctuations in production are seen. From 1879 to 1887 the output of the blast furnaces of the country more than doubled, amounting to 6,417,148 gross tons the latter year, against 2,741,853 tons in the former year. In this period some years showed a gain of over 1,000,000 tons on their immediate predecessors. In one year, 1886, the increase was over 1,500,000. Yet there were in the same period some years of depression in which the production of pig iron showed a decrease, notably in 1884, when there was a decline of 500,000 tons as compared with the previous year. It is a very simple task to ascertain the net increase in production in these eight years—namely, 3,675,295 gross tons, and dividing that quantity by eight obtain 459,412 tons as the average yearly gain, and theorize as to the more healthful condition of the trade if each year had shown just about such an increase.

Steel rails could be taken in the same way. In 1879 their production, including open-hearth rails, was but 618,851 gross tons, whereas in 1887 the output had grown to 2,119,049 tons, or considerably more than treble. But, notwithstanding the huge net increase, there were years during that period when the production declined instead of advancing. The three years covering 1883 to 1885 witnessed such a movement. But in both 1886 and 1887 an enormous development occurred, the mere gain in each year equaling the entire production of 1879. If the annual increase in production from 1879 to 1887 had been distributed evenly throughout that entire period, each year would have shown a gain of 187,524 tons over the output of the previous year. It is unnecessary for purposes of illustration to take up any other branches of the iron and steel trades, as in the production of all staple articles similar conditions have prevailed.

In no other country in the world do seasons of prosperity cause such an increase in the consumption of iron and steel as in the United States. The rapid growth of population, the enterprise of capitalists in building new lines of railway wherever opportunities of profit are seen either in constructing or operating them, the constantly developing riches of our natural resources and the superiority over other nations of the purchasing power of the masses of our people combine to make the consumption of all classes of products greater *per capita* at any time, but this consumption increases enormously when general prosperity abounds. Our manufacturers then expand their facilities to meet the increased demand upon them, manufacturing establishments multiply, more workmen are called in, new districts are developed, improved methods for securing an enlarged output are devised, and in every way the productive forces of the country endeavor to prove themselves equal to the emergency.

When the active movement has exhausted itself, however—or, in other words, when the floating capital of the country has been absorbed in permanent improvements, a season of rest and recuperation follows, consumption of iron and steel decreases, and manufacturers find themselves with a diminished market. They then quickly adjust themselves to the new condition of affairs. Blast furnaces are blown out by their owners, who prefer to have them stand idle rather than to turn out pig iron for which there is no immediate demand. Possibly the avoidance of the British policy of accumulating large stocks of pig iron in the hands of furnacemen has much to do with the usual rapid recovery of our pig-iron trade from extreme depression. Rolling mills and steel works also restrict their output to the requirements of the situation, and all along the line, from the producers of raw material to the manipulators of the highly finished product, the aim is toward further curtailment, unless in their restless enterprise individual owners happily discover some new outlet into which they can direct their product.

Under such circumstances as here have been portrayed a gradual increase in production from year to year is impossible. The iron and steel manufacturers do not control circumstances, but, on the contrary, are controlled by them. Even if they had a foreign trade it would necessarily be subject to similar fluctuations.

We have just passed through one of these seasons of curtailment of production, following a period of great activity. Now the skies are again brightening, and the indications favor a renewal of the demand for iron and steel which may perhaps test the capacity of our works and put to rout the prophets who have been predicting disaster as a result of the large number of new establishments built in various parts of the country, but particularly in the South. It would not be at all singular, but in strict accordance with our past experience, if it should be found that these new works, instead of proving a menace to older establishments, have simply been erected in time to meet the requirements of another period of increased consumption.

The Cullom Bill Against Trusts.

Senator Cullom has introduced a bill which thoroughly shows that there are at least a few public men who are willing to become the leaders in a crazy crusade against all associations formed to regulate trade. We have repeatedly emphasized the point that there is some danger that popular opposition to a few gigantic trusts may lead to an indiscriminate assault upon trade associations and combinations. To what lengths such men are willing to go is well illustrated by the bill in question, of which the following is a synopsis:

By the first section all arrangements, contracts, agreements, trusts or combinations between persons or corporations or between persons and corporations, made with a view or which tend to prevent full and free competition in the production, manufacture or sale of any article of domestic growth, production or manufacture, or in the importation of any article produced or manufactured in a foreign country, or in the sale of any article imported into the United States, or which tend to advance the cost to the consumer of any such articles, or which tend to create any restriction upon Interstate trade, or any importation or exportation, or which tend to limit or reduce the production, manufacture or sale, or to increase or reduce the price of any article of growth, production, or manufacture that enters into trade between the States or Territories, or which tend to create a monopoly, are declared to be unlawful combinations, and to be against public policy, unlawful and void. The second section provides that any person entering into any such combination on his own account, or as agent for another, or as an officer, agent or stockholder of any corporation, or as a trustee or committee, or in any capacity whatever, shall be guilty of a high misdemeanor, and be subject to a fine of from $1000 to $10,000, or imprisonment from one to five years, or both, in the discretion of the court.

Section 3 provides that all shares of stock and all real and personal property belonging to any such unlawful combination, or to any of the parties thereto, which may be placed in trust or used in furtherance of the purposes of any such unlawful combination, together with all articles of property grown, produced, manufactured, imported, held or kept for sale to advance the purposes thereof shall be forfeited to the United States and liable to seizure.

Section 4 makes it the duty of Customs officers to seize and secure shares of stock and real and personal property made liable to seizure by the bill, and provides that the same proceedings shall be had for the seizure, condemnation and sale thereof, as in cases of seizure of property under the revenue laws Section 5 provides that out of the proceeds of such sales there shall be paid: First, all costs of seizure, condemnation and sale. Second, claims of the United States for duties or taxes. Third, liens for State taxes and assessments. Fourth, unpaid judgments against parties convicted as parties to such unlawful combinations. Fifth, claims provided in favor of persons injured by means of such unlawful combination.

Of the balance one-half is to be paid into the United States Treasury and the other half distributed to the parties interested.

Section 6 authorizes that any person or corporation injured or damnified by such unlawful combination to sue for and recover double the amount of damages suffered. Any one of the parties to such combination may be made defendant in such suit.

Section 7 provides that the purchase of merchandise or commodities in any foreign country for sale in this country, or in any State or Territory, by any such unlawful combinntion or its agents, shall constitute a violation of the act and subject the offender to the penalties prescribed.

Section 8 provide that when any action at law or suit in equity shall be commenced in any United States court it shall be lawful in defence thereof to plead in bar or in abatement that the plaintiff, complainant or any other person interested in the prosecution of the case is a member or agent of such a combination as the bill declares unlawful, or that the cause of action grows out of such a combination or out of some business or transaction thereof.

In other words, confiscation of half their property besides the infliction of fines and imprisonment to individuals are to be meted out to those who enter into or are in any way identified with trusts or combinations. Such a proposal diliberately brought before the highest legislative body of the land is not worth serious consideration for its own sake, because the business men of the country have too commanding a voice in its councils. But the very fact that such a bill could be drawn up and presented is in itself significant. To us the proposal to put every trade association into one category is the most striking feature. It is quite useless to deny that public opinion condemns organizations like the sugar trust. Means are being earnestly sought to reach them, and to check the tendency toward forming similar enterprises in other trades. It is possible that opposition to them may become so strong that the tentative measures adopted will bear heavily, not alone on those whom it is the object to reach, but will strike others who should be let alone. Senator Cullom's bill can never pass, but it is not impossible that legislation containing features highly injurious to the manufacturing and trading interests of the country may be approved in a rush to catch popular favor by crushing trusts

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The recent advance in old rails has again brought up as a subject for discussion the question how large is the reserve of that rare material still in the tracks. We hear the opinion frequently expressed that before long the supply will be exhausted, and that then certain industries dependant upon old iron rails will be forced to turn to something else. Yet the day when the last iron rail will be taken up is further away than the majority of those interested seem to think, unless the data collected by the authors of Poor's Manual are based on inaccurate returns. The following statement of the numbers of miles of steel and iron rails in the tracks in the United States shows that nearly one-third of the total track is still equipped with iron:

Year.	Miles steel rails.	Miles iron rails.	Total miles.	Per cent. steel of total.
1880.....	33,690	81,967	115,647	29.1
1881.....	49,063	81,473	130,536	37.5
1882.....	66,601	74,269	140,960	47.3
1883.....	78,491	70,692	149,183	52.7
1884.....	90,243	66,254	156,497	57.6
1885.....	98,102	62,495	160,597	61.0
1886.....	105,724	62,324	168,048	62.9
1887.....	128,959	60,388	189.347	68.1

In seven years the mileage of iron rails has been reduced by 21,579 miles, so that at the same rate of exhaustion the supply would last nearly 20 years longer. Of course there are many considerations influencing the rate at which our bar mills and the works running on track material draw on the reserves. The questions of the relative cost of new steel rails, of accessibility of the old material, of the future demand for finished product, of the relative cost of old iron and new steel, angles, bars, spikes, &c.—all these considerations affect the problem. But the scare of an early end of the supply of old rails may as well be dismissed. They will last ten years longer at least.

Relations with China.

There is reason to fear that the hasty rejection of the Chinese treaty by both houses is a grievous mistake. It is an offense against a friendly power that cannot be justified. Moreover, the legislation proposed assumes that evils exist which are merely hypothetical. Under the present laws no invasion of Chinese emigrants has occurred which need excite alarm. Taken at the worst, the bland and meek-eyed Chinaman is not to be compared with specimens of some other nationalities. It is to be borne in mind that there exists a British influence exceedingly hostile to American interests in China, and is quick to turn to advantage any legislation inimical to the Chinese Government which may take place in the United States. Therefore, it is hardly worth while to hazard international relations and to embarrass our foreign commerce with a vast empire like China, to say nothing of the injustice involved, while seeking to correct evils more imaginary than real, and which may exist only somewhere in the remote future.

It is doubtless true that China is now entering upon an eventful period in her history; momentous changes affecting her civilization are imminent. At this moment several important enterprises are pending in this country, prominent among which are grand schemes for railway improvement to which the Government is impelled to commit itself, however, reluctantly in consequence of advances making by Russia in the same direction. A new system of finance is also in contemplation, as seen by the negotiations of Count Mitkiewicz, Mr. Barker and others of the alleged American syndicate. Americans have ranked high in the estimation of the leading statesmen of China, and there is reason to believe that American influence might acquire an important ascendency both in diplomacy and in trade, as compared with Great Britian or any power, were it not for the rash and ill-considered measures agitated at Washington.

CORRESPONDENCE.

The Chemistry of Foundry Irons.

STIRLING FURNACE, STIRLINGTON, N. Y., September 8, 1888.

To the Editor: I regret that I have been unavoidably delayed in answering the valuable contributions on above subject from Messrs. Chauvenet, Birkinbine and Uehling, but will now take them up separately and make a few remarks on some of the main points presented by them.

By adding the point made by Mr. Chauvenet on the amount of graphite present in open and close iron, I must certainly modify the latter part of my sentence, viz.: "An open iron was sure to have a high percentage of graphite, and a close iron a low percentage of graphite." This sentence was carelessly written, for the latter half should have been omitted as misleading. I am grateful to Mr. Chauvenet for having called attention to it, as it might have led to difficulties had a furnaceman tried to induce a founder to accept a close-grained but graphite iron, such, for instance, as mentioned by Mr. Chauvenet. The point I endeavored to make was that in an open foundry iron graphite was sure to be sufficiently high for all its purposes, and at present, while the founders will accept nothing but open-grained iron, it would have been waste of time to determine graphite in every sample. I fear it will remain so for some time to come to analyze close iron for graphite, as the average founder would not accept it, no matter if told it contained 4 per cent. of graphite. The point here discussed was very excellently stated in one of your editorials. It is just on this point that analysis would be of great value to the furnaceman, if he could only get the founder to accept analysis as one of the tests of the iron. Of course it is necessary to have physical tests, such as Keep's, go hand in hand to obtain the best results, but even analysis alone would be an important factor if thereby such iron as described by Mr. Chauvenet could be sold on equal terms with open iron from the same cast, for such iron is certainly of equal value with the open iron. Yet it may prove hard to convince the skeptics in the foundry trade of this.

I was much interested in the statements made by Mr. Birkinbine regarding cost figures of Scotch irons at Memphis, which show plainly how far even the financially far-sighted American founder will go in paying excessive prices for the sake of getting what he assumes to be the only kind of iron, when he can get exactly what is needed for a much lower figure. At the same time, we must not forget to look at his side of the question. He is undoubtedly influenced by the fact that, apparently, the American furnaceman has not fully possessed the same knowledge of exact quality nor the same regularity of product as possessed by the Scotch furnaceman, and that he (the founder) has therefore really not been able to get just what he needed with sufficient regularity, and hence would run risks, which made him prefer the higher priced but surer article. Yet it seems to me where the founder is at present to blame is in the apparently utter indifference of all but the largest concerns to all questions of scientific import, thereby naturally discouraging the progressive furnaceman from adopting a scientific basis; for certainly, if the founder is not going to encourage the furnaceman in his efforts it will not pay the latter to go ahead, spend the money, and yet have as hard a time as before to convince his customers of the quality of his metal. The almost total absence of all reference in foundry papers on the remarks of Messrs. Chauvenet, Birkinbine and

Uehling certainly seems to give proof to the above remarks.

I furthermore agree perfectly with Mr. Birkinbine in contravening the statement that the analysis will settle the quality of the iron, for the defining of the analysis must be accompanied by physical tests, such as Keep's tests.

There is one point about Mr. Uehling's interesting letter that I would caution against. He speaks about iron being chilled by running into wet beds, and infers that it may be as good as the rest of the chilled iron. I do not believe he meant it in that way, but it reads so, and might be misleading. The close iron can only have the same value if it has the same graphite. Close iron made in the way described by Mr. Chauvenet—*i. e.*, run a little slow, but not chilled—will have practically the same graphite while chilled iron will not—its graphite having been converted into combined carbon. This is especially instanced in the last part of my original notes and analysis on sows and pigs.

As to Mr. Uehling's final statement that the value of graphite is overestimated, I am hardly prepared to accept that *in toto*, judging from all experiments and general information on the subject. Yet he may be nearer right as to the ultimate results than I am. Furthermore, the very interesting, and, if fully sustained, very valuable, work of Messrs. Keep, Maybery and Vorce on the effect of aluminium on foundry irons seems to point very strongly to the fact that graphite is the ruling factor. If you will permit me I will make a few remarks on this work, as also on the discussion between Messrs. Keep and Hammer, in your next issue.

I will now, in conclusion, call attention to a very thorough series of experiments made by the German Government, in 1877, under the direction of Wachler, at the instance of a number of leading German ironmasters. The conditions there existent were similar to ours here, but in a stronger degree. Scotch and English irons ruled the market on the upper grades; all foundries used these as their fundamental compounds, to the detriment of the German irons, which they considered inferior. The Government was finally induced to undertake comparative investigations between German and foreign works, which, when conducted with the utmost impartiality, proved the full equality of the two works and sufficiently stirred up the German founders to the actual conditions, eventually greatly benefitting the home industries. But, as a sad commentary on the doctrines of free trade, a supplementary note by the author, a few years later, stated that although the scientific gains had been very great the actual gains, owing to then existent free trade, had been practicaly *nil*, as the foreign irons, owing to the peculiar adaptability of Great Britain for cheap iron manufacture, were put on the German market at such greatly lower prices that in spite of an increased demand for German irons these were unable to compete in price, and many works forced to shut down.

CARL A. MEISSNER.

Influence of Aluminium Upon Cast Iron.

BRADFORD, CONN., September 11, 1888.

To the Editor: Permit me. Mr. Editor, to thank Mr. Keep for the additional facts submitted in his letter of September I. It seemed to me that to a cautious reader of his original paper this supplementary information was essential to an appreciation of the precise value of his experiments; but, even in the new light, it cannot but appear desirable that the introduced aluminium should be free from the company of that most potent element in determining the physical status of cast-iron—silicon. Mr. Keep seems inclined to doubt the effect of small quantities of silicon, but he shows his entire understanding of the subject by adding: "Although, by inference, we have a right to assume that any amount of silicon does produce a corresponding effect." However, we are not left to the philosophy of inference in this matter. In the words of Mr. Outerbridge—quoting from his paper in the Franklin Institute *Journal* for March: "A very small variation in the percentage of silicon produces a prodigious effect in this particular"—referring to the influence of silicon upon chilling quality. The researches of Mr. Ford in accounting for the great difference in the working of hot and cold blast pig iron and in discovering the qualities which determine the durability of car-wheels, also the experiments of Colonel Caron, a French scientist, who, in testing steels, discovered the property that minute quantities of silicon have, in obstructing the process of hardening by retaining the carbon in a graphitic or semi-graphitic state—such results, it seems to me, may be taken as definitely establishing the fact that "any amount of silicon does produce a corresponding effect." But precisely what this effect shall be cannot—in the present state of our chemical knowledge—be predicted.

Aside from the mistake in quoting the amount of sulphur, which was either a slip of the pen or the printer's fault, I think this is where Mr. Keep misunderstands me; for in venturing the statement of the effect of small quantities of silicon I did not intend its application to the particular iron he dealt with, but rather to publish my own experience with some irons and to show that in some cases sufficient silicon might be introduced in such an alloy to materially affect the mechanical properties of the iron. The sensitiveness of cast iron to the introduction of silicon would seem to depend upon the proportion of the contained phosphorus, sulphur, and especially manganese, and it can be readily understood that the same quantity of silicon which added to one iron would effect a complete change might in another case produce no appreciable effect. My knowledge of this fact would of course have prevented me from making any assertion with regard to the particular irons used by Mr. Keep; but as an interested and appreciative reader of his paper it seemed to me impossible to arrive at even a general conclusion touching the influence of aluminium until it was known what account had been taken of the introduced silicon. Thanking Mr. Keep again for the courtesy he did me by his reply, I am, Mr. Editor,

Yours truly,

ALFRED E. HAMMER.

The Naval Reserve.—The *Marine Journal* publishes the following list of American steamers which will answer the requirements of the Naval Reserve bill in regard to speed:

Vessel.	Hailing Port.	Tonnage.	Speed.
Newport	New York	2,735	17.9
City of Augusta	Savannah	2,870	16.5
City of Puebla	San Francisco	2,624	16.5
Queen of the Pacific	Portland, Ore	2,728	16.5
Alameda	Philadelphia	3,158	16.5
Mariposa	San Francisco	3,158	16.5
State of California	San Francisco	2,286	16
Alliance	New York	2,985	16
Louisiana	New York	2,840	16
Ohio	Philadelphia	3,120	15.6
Saratoga	New York	2,426	15.4
City of Alexandria	New York	2,480	15.4
Nacoochee	Savannah	2,680	15.4
Chattahoochee	New York	2,676	15.4
Roanoke	New York	2,354	15.4
Excelsior	New York	3,264	15.4
Alamo	New York	2,943	15.4
Lampasas	New York	2,943	15.4
El Paso	New York	3,531	15.4
El Dorado	New York	3,531	15.4
H. F. Dimock	Boston	2,625	15.4
Herman Winter	Boston	2,625	15.4
Seminole	New York	2,557	15.4
El Monte	New York	3,531	15.4
San Pedro	New York	3,119	15.4
San Pablo	New York	4,064	15.4
Cherokee	New York	2,557	15
Santa Rosa	New York	2,417	15

The Navy Department has thus accredited 28 American steamers of from 2400 to 4000 tons, with a sea speed of 15 knots or over, and from these vessels, should the Naval Reserve require them, selections will be made.

Losses on the Atlantic.

It is certainly a startling fact that in the space of 47 years since the unfortunate President left New York on March 11, 1841, never again to appear to mortal ken, nearly 100 fine steamers have been utterly destroyed while on their passage across the Atlantic. Of these, eight, after leaving port, mysteriously disappeared and have never since been heard of; ten were run down in collision; five were burned; one ran on sunken ice in the Straits of Belle Isle; three foundered in mid-ocean, and the remainder of the melancholy list were wrecked either on the Irish and British coasts, on those of America, or on islands or rocks off them. Fully ten of these ran in foggy weather on the shores of Nova Scotia or Newfoundland on their westward voyages, a sufficient warning, it might be supposed, to captains to give a wide berth to those latitudes. Only one, the Iowa, an American steamer, was wrecked on the French coast, near Cherbourg, in 1864. It is generally supposed that shipwrecks are caused by the rage of the elements, but of all the vessels that went ashore only three or four appear to have directly suffered in consequence of heavy weather. Miscalculations as to distances run and courses steered, clouded skies, dark nights, and more than all, dense fogs, were the primary cause of the disaster.

Comparatively few of these shipwrecks occurred without serious loss of life, at least 5600 persons having perished among the passengers and crews who were on board. When the Atlantic was wrecked on Meagher's Head, off the fatal Nova Scotian coast, in 1873, no less than 562 persons were drowned. With the City of Glasgow 480 people disappeared; with the President, 120; with the Pacific, 186; and with the City of Boston, the last of the missing steamships, 191. When the Austria was burned in mid-ocean 470 lives were lost; with the Arctic, 323; with the Anglo-Saxon, 372; with the Ville du Havre, 226; with the Borussia, 200; and with the Schiller, 311. The destruction of other vessels caused the loss of fewer lives than the vessels named, as, happily, fewer passengers were on board, but with several on the list from one to 200 beings perished. In 1873 no less than six large steamships were wrecked, run down or disappeared, the most disastrous losses being those of the Atlantic and the Ville du Havre, a total of 788 lives.—*Harpers' Weekly.*

The H. C. Frick Coke Company, of Pittsburgh, have postsd notices at all their works in the Connellsville region to the effect that the wages of their employees will be advanced 5 per cent., the advance to take effect from September 1. The advance is a voluntary one and is taken as an indication that there is a decided improvement in this industry, both as regards demand and selling price.

In a lecture delivered last December before the Franklin Institute, Mr. John Birkinbine refers to a peculiar and apparently isolated deposit of Clinton fossil ore, which exists at Iron Ridge about 50 miles north of Milwaukee, Wis. The ore soon after mining breaks into grains which from their shape, size and color have given to it the name of "flaxseed ore." Another deposit of fossil ore is reported further north in Wisconsin. The Iron Ridge ore carries such proportions of phosphorus, lime and silica as to invite attention to it for use in producing steel by the basic process.

TRADE REPORT.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., PITTSBURGH, September 11, 1888.

While there is no disputing that there has been an important and legitimate improvement in the general Iron and Steel business within the last 60 days, there is evidence of an intended boom on the part of speculators, who are anxious to excite the market and run it up higher, but it is not likely that they will be successful. Already the feeling begins to obtain on the part of the trade generally that the danger line has been reached; that much higher prices will stimulate importations from foreign countries, which they are anxious to avoid. It is believed that a good many sales are reported that never were made, from the fact that the prices are considerably higher than other offers are being made to sell at. This species of manipulation may do in stocks, oil or wheat, but it will not do in the Iron trade, which has always been conducted upon a legitimate basis, and is governed and controlled by the law of supply and demand.

The general position of the Iron market is fairly satisfactory; there is an increasing volume of business, but prices of the products have not as yet got up to correspond with the enhanced cost of the raw material, and there is a good deal of complaint in consequence. As it is now mill owners cannot get cost out of the finished Iron, and it is evident that either the one will have to advance or the other decline.

Pig Iron.—The market is active, sales of some 15,000 tons having been reported, in addition to a good deal of business which is not made public. As regards prices, there has been no quotable change. Consumers generally are very well stocked, as they have been buying pretty freely ever since the market began to advance, and having bought at prices much below those now current, and believing, as many of them do, that the upward turn has been arrested, it is not strange that they are now holding off. However, furnacemen are generally well sold up, some of them for the remainder of the year, but additional furnaces are being started up and production increased. Furnaces that have been idle for several years are being placed in readiness to start up—among other the old Clinton, which will be operated by a syndicate of creditors of Graff, Bennett & Co., the former owners. The market is being watched with a good deal of interest, as it is believed by many that the highest point has been reached, and as a consequence there is more disposition to sell and less to buy; however, there is no indication of anything like a collapse, nor is such a thing at all probable, but there is reason to believe that the market will settle down at present prices, which may be fairly quoted as follows:

Neutral Gray Forge	$16.00 @	$16.50,	cash
Ali Ore Mill	16.75 @	17.00,	"
No. 1 Foundry	17.50 @	18.00,	"
No. 2 Foundry	16.25 @	16.75,	"
No. 3 Foundry	15.50 @	16.00,	"
No. 1 Charcoal Foundry	23.00 @	24.00,	"
No. 2 Charcoal Foundry	21.00 @	22.00,	"
Cold Blast Charcoal	25.00 @	28.00,	"
Bessemer Iron	18.00 @	....	"

There have been sales of Bessemer reported at $18.25, cash, but your correspondent has heard of no reliable sales above $18, cash, and some of the brokers say they are still prepared to make additional sales at the price quoted. In regard to Mill Iron, there have as yet been but few sales at $16.50, cash.

Muck Bar.—There have been sales at $29 @ $29.25, cash, showing but little change on the prices of a week ago. While it is true that some sellers are holding for $30, and refusing to sell for less, thus far we know of no sales having been made above $29.25, and buyers have no trouble in getting what they want at the prices quoted. It is said that there is a very fair margin for profit at present prices.

Manufactured Iron.—There is a continued fair demand for Merchant Iron, and prices are firm, although as yet they have not advanced as much as the raw material; both jobbers and large consumers, impressed with the belief that prices may go still higher, are buying pretty freely, and the mills generally are fully employed. Some mill owners are not disposed to contract for future delivery at present prices. We quote Bars at 1.80¢ @ 1.85¢, 60 days, 2 % off for cash. There is an increasing demand for Skelp; those mills making a speciality of it have about all they can do; Grooved is quoted at 1.80¢ to 1.85¢, and Sheared at 2¢ @ 2.10¢.

Nails.—While trade continues dull for the season, the market is firmer, owing to increased cost of Nail Slabs, which have advanced $1 @ $1.50 ℔ ton, as compared with the lowest. That the market has stiffened is evident from the fact that buyers are now willing to pay card rates, which they refused to do until within the past week. This proves that makers west of here who have been cutting, are now exacting full rates. The demand, while somewhat better, is poor for the season, and not likely to amount to much this fall; at least there is not much indication of it at present. We continue to quote at $1.90, 60 days, 2 % off for cash.

Wrought-Iron Pipe.—There is a fair degree of activity, but prices continue irregular and unsatisfactory. Some of the old mills, with a trade established years ago, are pretty well employed, but others, of recent origin, new in the business, have but little to do. Some of the latter are doing next to nothing. However, owing to enhanced cost of Pipe Iron, prices are firmer, and the very low rates of a month ago cannot now be obtained. Discounts are quoted at from 55 to 57½ % on Black Butt Welded and 65 @ 67½ on Black Lap Welded; Boiler Tubes 65 % off, large lots.

Old Rails.—There is still considerable inquiry and much limited offerings. The market is firm with sales of American Tees at $24.50 @ $25. As yet but few have been sold above $24.75, which price was obtained for a lot delivered at Youngstown, Ohio. The great trouble with consumers was that they nearly all closed their mills on July 1st with little or no stock, and then when they started up they were on the make at once, which sent prices up faster than they otherwise would have gone. However, the stock of American is light, and foreign cannot be laid down in Pittsburgh at prices quoted. It is claimed that there is an effort being made to manipulate the market, but whether there is anything in it we cannot say.

Steel Rails.—There have been no sales reported here of late, and there does not appear to be much inquiry. However, as the railroads are generally reported as doing well it is thought there will be more miles of new roads built in 1889 than during the present, and there is a possibility of an improved demand for Rails before the close of the present year. We continue to quote heavy sections at $30 free on cars here.

Railway Track Supplies.—Demand continues light for the season, while prices remain unchanged. Splice Bars, $1.80 @ $1.85; Track Bolts, $2.85 with Square, and $2.95 with Hexagon Nuts. There may be an improved trade before the close of the present year. The enhanced cost of Old Rails will add largely to the cost of making Spikes, for which they are largely used, and with anything like a demand Spikes would advance.

Merchant Steel.—There is a fair business reported at unchanged prices. Best brands Tool Steel, 8½¢; Crucible Spring Steel, 4½¢; Crucible Machinery, 5¢; Open Hearth, 2¾¢.

Billets, &c.—Bessemer Steel Billets are quoted at $29, cash, delivered on cars at maker's mill, and the same quotation will answer for Nail Slabs. Domestic Rail Crops and Bloom Ends, $19.

Old Material—There is an improved demand for all kinds of Old Material, and prices are firmer and higher. Sales: No. 1 Wrought Scrap, at $21 net ton; Car Axles, $24 @ $25; Wrought Turnings, $13.50 @ $14; Cast Scrap, $15.50 @ $16, gross; Cast Borings, $12 @ $13; Car-Wheels, $20. There is very little inquiry for Wheels in this market.

The partnership heretofore existing between Jacob P. Koehler and George A. Koehler, under the style of Koehler & Co, dealers in Scrap Iron and Metals, on Pike street, Pittsburgh, Pa., has been dissolved by the retirement of George A. Koehler. The business will be conducted under the same firm name by the remaining partner at the old location.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington St., CHICAGO, September 10, 1888.

Pig Iron.—A further improvement is perceptible both as to demand and prices. Quite a considerable quantity of Lake Superior Charcoal Pig Iron has been called for by the Malleable Iron trade, showing that their requirements have not yet been filled, but they have few brands to select from. Car-Wheel manufacturers are not in the market to any extent. If they should be obliged to make purchases, as they soon may with the improving demand for cars, the price of Charcoal Pig will not long remain at its present figures. Soft Coke Irons are very firm, and the prices of some favorite brands of American Scotch have been marked up 50¢ to 75¢. Even Southern Ohio Irons feel the effects of the improving condition of the Iron trade, the large stocks held by the furnaces of that district no longer operating as a bar to an advance. Agents for these as well as for other furnaces are being instructed to leave no propositions open on orders of any size. The condition of Southern Coke furnaces is reported by recent observers, who have visited the active plants, to present very little danger of an excessive supply of Pig Iron being thrown upon the market for the remainder of this year. Prices have been advanced upon such grades as are still unsold to a point which will very probably keep them out of this market for a time, unless the price of Northern Irons is marked up correspondingly. Lake Superior Coke Irons have not advanced as much as the prices of other classes of Pig Iron would seem to warrant, but they now show indications of improvement. Cash quotations are as follows: Lake Superior Charcoal, all numbers, $19.50 @ $20.50; Alabama Car-Wheel, $26.25; Southern Charcoal Foundry, No. 2, $18.50 @ $20; Jackson County Softeners, No. 1, $18.25 @ $18.75; Hocking Valley, Soft Foundry, No. 1, $17 @ $18; American Scotch (Blackband) No. 1, $19 @ $20; other Ohio Scotch Irons, No. 1, $18 @ $18.50; Lake Superior Coke, No. 1, $17.50 @ $18.50; No. 2, $16.50 @ $17.50; No. 3, $15.50 @ $16.50; Southern Coke, No. 2, $18; No. 2½ and Open Bright, $17.50; No. 3, $16.50 @ $17.

Bar Iron.—It is difficult to quote prices just now, as the mills seem to be competing with one another to see which can name the highest figure. The range during the week has extended from 1.70¢ to 1.85¢, f.o.b. Chicago, half extras, for carload lots of Common Iron. Of course the mills asking the highest prices are out of the market, but if conditions remain as they have been the cheapest sellers will soon be filled up, and the prices which seem high to day will be looked upon as quite reasonable. Figuring on the basis at which some contracts are known to have been taken in August—namely, 1.50¢, f.o.b. Chicago, and taking 1.75¢ as about the present rate, the advance has been $5.60 per gross ton. And yet there are believers in a still greater advance, who argue that the car builders will certainly need a great deal of Iron this fall and winter, caused by a heavy increase in the consumption. A great deal of work is in sight among the miscellaneous consumers of Bars, and good business seems to be assured for some time to come. From the comments now being made by manufacturers and their agents it would not be surprising if an attempt should be made to restore the old rate of extras. Store prices range from 1.80¢ to 2.10¢ for Common Iron, with a good demand and firm tone.

Structural Iron.—A fair business has been done in this line. Prices for mill lots are now as follows, f.o.b. Chicago: Angles, 2.35¢; Universal Plates, 2.40¢; Tees, 2.65¢; Beams and Channels, 3.40¢. Store prices are as follows: Angles, 2.40¢ @ 2.50¢; Tees, 2.60¢ @ 2.70¢; Beams, 3.80¢.

Plates, Tubes, &c.—Quite a number of orders were taken for carload lots of Plates and a very good business was done in small lots also. The mills are getting more decided in their views of higher prices, and it seems to be a mere question of time when prices will be advanced here. Some of the Tube mills have notified their agents of an advance, but the others are holding to their former figures. Quotations are unchanged, as follows: Heavy Sheets, Nos. 10 to 14, 2.65¢; Tank Iron, 2.55¢; Tank Steel, 2.80¢; Shell Iron, 3¢; Shell Steel, 3.25¢; Flange Iron and Steel, 4¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢; Boiler Tubes, 60 % @ 65 % off on 2½-inch and larger, and 62½ % off on 2-inch and smaller.

Sheet Iron.—A few mills which had wisely refrained from filling up with orders when prices were at their lowest are profiting by the demand now being experienced. They report sales for October and November delivery at 3.10¢, f.o.b. Chicago, for No. 27, and expect to get 3.15¢ shortly. Jobbers continue to quote small lots of No. 24 at 3.30¢, Nos. 25 and 26 at 3.20¢, and No. 27 at 3.30¢, with a small concession to best buyers. They are having difficulty in getting deliveries from the mills, which seriously interferes with their trade.

Galvanized Iron.—Stocks in the Chicago warehouses are more broken than ever, in consequence of the inability of the mills to ship fast enough to keep up with sales. Prices of large lots are unchanged, but agents are looking for an advance in rates, which they think is warranted by the very encouraging condition of business in this and related branches. Quotations for small lots are as follows: Juniata, 60 and 10 % off; Charcoal, 60, 10 and 5 % off.

Merchant Steel.—An increasing business is reported in the higher grades, showing an improving consumption. Prices are unchanged, store rates being as follows: Bessemer Bars, 2.30¢ @ 2.40¢; Tool Steel, 8½¢ @ 9½¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.40¢; Open-Hearth Spring, 2.90¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 10¢.

Steel Rails.—Small sales have been made, amounting to probably less than 5000 tons in the aggregate. The North Chicago Rolling Mill Company's South Chicago mill will resume operations next week on old orders for this month's delivery. They hope to receive enough new business in addition to keep the mill in operation during the remainder of the fall months. The outlook for heavy trade is not encouraging, although next year is looked forward to with decided hopefulness. An effort is being made to get $31 on contracts now coming up.

Old Rails and Wheels.—Several thousand tons of Old Iron Rails have been sold at prices ranging from $24 to $25. The higher figure now seems to be the ruling quotation, with but a light supply in sight. Old Car-Wheels are very scarce, and transactions are consequently light. A few tons have been picked up at $18.50 @ $18.75, but holders generally ask $19 @ $19.50.

Scrap.—Business has been dull during the week. The railroads are offering larger quantities than usual for sale this month, evidently to take advantage of the recent advance in prices. Dealers, however, are looking for a slight decline now, as a result of the advance in freights to Pittsburgh and Mahoning Valley points, at which much of the Scrap accumulating here is marketed. Quotations for carefully selected are as follows, ₱ ton of 2000 lb: No. 1 Forge or Railroad Shop, $19 @ $19.50; Track, $18.50; No. 1 Mill, $15 @ $15.50; Light Wrought, $11; Horseshoes, $18; Axles, $25; Cast Machinery, $13.50 @ $14; Stove Plate, $11; Cast Borings, $9; Wrought Turnings, $11; Axle Turnings, $13; Coil and Leaf Steel, $16; Locomotive Tires, $16.50.

Hardware.—A fair demand for Heavy Hardware is noted. Wagon Stock is rather dull, but in Iron, Steel, Blacksmiths' Supplies, &c., a little more business is being done than in previous weeks. Nuts are hardening in sympathy with the advance in Bar Iron, which may also be expected to affect other Bar Iron products if it is maintained for any length of time. Shelf Hardware is moving, the demand being good from all quarters tributary to this trade center. Commercial travelers are sending in very encouraging reports of the prospect for future business, which it is predicted will assume large proportions as soon as the safety of the corn crop is assured beyond all doubt. Very little speculative buying is now being done, and it will be discouraged by the prominent houses here as much as possible should a tendency develop itself when activity in trade sets in.

Nails.—Some good sales of Steel Nails have been made by manufacturers' agents at the advanced price, but the demand is not general. The Wheeling mills are holding firmly at $1.90 at mill for large lots, and another advance of at least 10¢ is expected. It is understood that a very important meeting of the Western Nail Association will be held at Wheeling on the 12th inst., which will result in the adoption of measures to sustain the advance. Stocks in dealers' hands here and at other points in the West are reported light. No heavy transactions in Wire Nails have come to light, but sales agents are known to have refused large orders tendered them at the prices ruling before the recent advance. They quote $2.55, f.o.b. Chicago, as their bottom rate. Store prices are unchanged at $2.10 for Steel and $2.60 for Wire in small lots.

Barb Wire.—The buying movement reported last week has grown a little stronger. Manufacturers are making sales of 50 to 100 tons to dealers in various parts of the Northwest who think this a good time to stock up, and jobbers are also meeting with some demand from their trade. Prices for small lots of Painted are quoted nominally at 3¢ and Galvanized at 3.75¢.

Pig Lead.—With but a light business in progress prices have been maintained between 4.65¢ and 4.75¢. At the close of the week 4.70¢ was bid and 4 75¢ asked.

The Laughlin Nail Company, of Wheeling, W. Va., have issued a very striking circular calling the attention of the trade to their Nails. Their weekly capacity exceeds 10,000 kegs, their factory being the second largest in the world. They make their Nails from Bessemer Steel, made specially for Nails, in their own Bessemer Steel plant. Geo. G. Spencer is salesman, at 115 Dearborn street, Chicago.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., September 11, 1888.

Pig Iron.—A very satisfactory week's business has been done in Pig Iron, and, doubtless, at somewhat better prices, taking an average of the entire market, although no quotable change can be made at present. But everything is firm, no shading whatever, but a gradual dropping out of sight of the inside quotation, and a gradual tendency to work toward the outside figures. Some fair brands of Iron may yet be picked up at $16, $17 and $18, delivered at tide, for the three grades, but the brands are limited in number, and the quantity available is still more limited. But when sellers begin to talk $16.50, $17.50 and $18.50 to $19, buyers are by no means anxious to place orders. They would buy largely at the former quotations, but beyond that they restrict their orders to immediate requirements, a kind of business which is quite acceptable to sellers, as they have no wish to discount the future to any great extent. On the whole, therefore, the market may be considered as perfectly satisfactory for the present. Buyers can get all the good Iron they require by paying a very slight advance, and at that advance sellers can market about all that they can spare. This leaves the future open to any changes that may take place. If the demand continues as it has been during the past 30 days, sellers will not only require more money for their product, but will get more money for it in a little while. Consumers will make no objection to a further advance, if they meet with a corresponding demand for their products, without which it would be impossible to inaugurate a successful movement of that kind. As to the probabilities, opinions are somewhat divided. A large business is believed to be assured, but it is doubtful if prices can be increased to even a very moderate extent without inviting a competition which would soon upset things again. There is not enough business on hand or in sight to warrant very hopeful expectations on this point. At a $1 per ton advance in Pig Iron, and $2 or $3 in Finished Iron, production would be greatly stimulated. A good general demand appears to be all that can be hoped for, and this can be easily met by mills and furnaces already in operation. Some time ago they were not running nearly full, while stocks of Pig Iron were accumulating at furnaces. The little turn that everybody was looking for has come, and things are moving nicely, but it may be altogether a mistake to assume that more furnaces and more mills can find a market for their output at advancing prices. All these things are, of course, within the range of possibilities, but for the present they are not regarded as probabilities, hence as this article remarked

last week Philadelphia is inclined to follow rather than lead in the matter of advancing either Pig or Finished Iron.

Foreign Iron.—Buyers are in the market at low prices, but there is not much probability of business being closed. Bids of $18, c.i.f., duty paid, are being made for 10,000-ton lots, against $20 asked.

Blooms.—There is a good demand at full prices, but sellers have not been able to establish any advance. Sales chiefly within the following range of prices: Nail Slabs, $28.50 @ $29.50; Billets from $30 to $35, f.o.b. cars at mill, according to analysis; Charcoal Blooms, $52 @ $54; Run-out Anthracite $42 @ $44; Scrap Blooms, $33 @ $35 ₱ "bloom" ton of 2464 lb. Foreign at tide, c.i.f., duty paid, $29 @ $30 for Nail Slabs; $31.50 @ $32.50 for 4 x 4 Billets, and $35 @ $39 for Siemens-Martin, price according to analysis, &c.

Muck Bars.—There has been a very active demand, under which prices were advanced to $29, Philadelphia, at which figures several lots were taken. Bids of $28.50 are made for large lots, but the supply is limited, and $29 a firm quotation.

Bar Iron.—The demand for Bars keeps up remarkably well, and buyers find prices gradually stiffening up. It is difficult to define the exact position, beyond saying that prices are slightly higher. Some mills talk 1.9¢ firm, others 1.85¢, while some would not be likely to refuse a desirable order at 1.8¢ or 1.82½¢. All depends on circumstances. Those that are full would quote the higher figure firmly, while those less favorably situated might accept the lower figure, so as to get some work ahead. Then the question of quality comes in, so that it is impossible to fix any definite figure and call it a firm price, but it is quite safe to say that an average advance of half a tenth has been made on everything, and is likely to be maintained. Skelp Iron continues to be in active demand, with sales at 1.82½¢ @ 1.85¢ for Grooved, and 1.95¢ @ 2¢ for Sheared. At the inside figures large orders are still on the market, but mills are pretty well filled up, and a further advance is being contended for.

Plate and Tank Iron.—A moderately large business has been closed during the week, and while sellers generally are asking more money, and getting it possibly in some cases, it would not be quite true to say that prices are higher. There is an impression that prices will be higher, and the outlook seems to warrant that opinion. The general demand is very good, while the shipbuilding interests seem likely to become large consumers during the next 12 months. Government work will be actively prosecuted, and there is reason to believe that a number of private firms will order additions to their respective fleets. In fact, shipbuilding is likely to be carried on during 1888 and 1889 on a larger scale than ever before. The following indicates some of the work which is under consideration: A number of large steamships for service to Australia will be built for Claus Spreckels, whose representative is now on his way to this city. Several large tugs, to be used at San Francisco, will also be constructed by the Delaware River shipbuilders. The Ocean Steamship Company, of Savannah, are about contracting for two steel passenger steamships for the coastwise trade between Philadelphia, New York and Savannah. The Standard Oil Company are contemplating the construction of a new bulk oil carrying steamer for the coastwise trade, and Boulter, Bliss & Dallett, who have sold two of their vessels, are on the lookout for others. The firm now has a vessel on the stocks in Cramps' yard. The Clydes are contemplating a new steamship service in the West Indies, probably to Hayti and the Windward Islands, and want several first-class vessels. It is said that within a few months the Delaware River shipbuilders will have enough orders on hand to keep them busy for two years, but there are no Transatlantic steamers included in the list. Prices about as follows: Ordinary Plate and Tank Iron, 2.05¢ @ 2.15¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.3¢ @ 2.4¢; Shell, 2.7¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3¼¢ @ 4¼¢.

Structural Iron.—Business in this department has not shown as much activity as in some others, although the Shape mills will doubtless fall into line soon. Work on old contracts is being actively called for and prices are rather firmer. Prospects moderately encouraging, but nothing specially important in sight at present. Prices as follows: 2.10¢ @ 2.15¢ for Bridge Plate; 2¢ @ 2.10¢ for Angles; 2.6¢ @ 2.7¢ for Tees, and 3.3¢ for Beams and Channels, Iron or Steel

Sheet Iron.—There is a very active demand for specialties, but in other directions there is not much improvement, although stocks are not accumulating to any extent. Good makes in small lots command about the following quotations:

Best Refined, Nos. 26, 27 and 28	3¼ @ 3½¢
Best Refined, Nos. 18 to 25	3 @ 3¼¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28	4½ @ 4¾¢
Best Bloom Sheets, Nos. 22 to 25	4 @ 4¼¢
Best Bloom Sheets, Nos. 16 to 21	3½ @ 3¾¢
Blue Annealed	2.8 @ 3 ¢
Best Bloom, Galvanized, discount	62½ %
Common, discount	67½ %

Merchant Steel.—No change to report. A fair business is being transacted and prices are quite satisfactory. Small lots from store are quoted as follows: Tool Steel, 8½¢; Machinery, 2.6¢; Crucible Spring, 4½¢; Open-Hearth Ordinary Spring, 2.7¢ @ 2.9¢; Crucible Machinery, 5¢; Best Sheet Steel, 10¢; Ordinary Sheet, 8¢.

Steel Rails.—There is not much change in this department, and on the whole business is rather disappointing. Sales of small lots are reported at $29.25 @ $29.50 at mill, but good-sized orders could be placed at $29, possibly a shade less if very desirable as to quantity, time of delivery, terms of payment, &c.

Old Rails.—There is an urgent demand, but in the absence of offerings it is impossible to say what the market is. Bids of $23 for T's were made to-day without bringing any response from holders, so that we quote $23 nominal.

Scrap Iron.—Under a heavy demand prices are again dearer, with sales at about the following figures: $20.50 @ $21 for cargo lots; $21.50 @ $22 for carload lots, delivered, or for choice $22.50 @ $23; No. 2 do., $14 @ $15; Turnings, $13 @ $14; Old Steel Rails, $19 @ $20; Cast Scrap, $14 @ $15; do. Borings, $9 @ $10; Old Fish Plates, $25 @ $26. Old Car-Wheels, $17 @ $18, Philadelphia, or its equivalent.

Wrought Iron Pipe.—There is nothing specially new to note in this department. Orders are coming in very rapidly, and prices show more firmness than for some time past. Discounts are quoted as follows: Black Butt-Welded, 55 %; on Galvanized do., 45 %; on Black Lap-Welded, 65 %; on Galvanized do., 52½ %; on Boiler Tubes, 60 %.

Nails.—The general improvement noted last week continues. Prices are firmly held, and the general outlook is fairly promising. Lots from store are quoted at $2, with the usual discounts on carload lots.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, September 10, 1888.

During the past two weeks there has been considerable apprehension that the continuous, and at times heavy, rains would seriously affect the crops of cotton and corn, especially the former; but so far as heard from, the crop is not sufficiently advanced to be much affected. Should the weather become clearer soon there will be no serious damage done and the year will close with one of the largest crops that has ever been raised in the South.

Pig Iron.—Beyond a gradual stiffening-up in prices and increased difficulty in making purchases, there appears to be nothing particular to note in the movements of this article. Furnaces that are not sold up to their entire capacity report no trouble in realizing from $1 to $2 more for their output than they did in June and July, and there is considerable anxiety manifested by some consumers in not being able to get contracts for future delivery at present prices, and instances are not wanting that for round lots for time deliveries present prices would be raised, but furnaces are disinclined to commit themselves to contracts to be filled excepting in the near future. Everybody appears to be looking for still higher prices during the present year.

Cincinnati.

CINCINNATI, September 10, 1888.

Pig Iron.—Individual sales of Pig Iron during the past week have been large, although the aggregate volume of business probably has not been much, if any, larger than that of several preceding weeks. A large proportion of the transactions have necessarily been for future delivery, the furnaces being so largely and heavily sold. A very strong tone has prevailed, but no further advance in prices is recorded, many furnaces and their agents deprecating higher prices, on the ground that any further advance will soon lead to increased cost of production by an advance in the price of Ore, Coke, &c., if not labor. At the same time, many furnaces, apparently, wish to encourage the belief in higher prices by not withdrawing decidedly from the market, but pricing their output at such figures as they think may discourage consumers temporarily, and at the same time may keep a buyer in view. The sales of the week have embraced the entire lots of Northern and Southern Irons obtainable, but probably more largely of Southern Ohio Forge Iron, one transaction noted being about 6000 tons for delivery extending through the remainder of the year; 1000 tons Southern Car-Wheel Iron was sold at $25, four months' time, and several lots of 1000 tons and more of both Forge and Foundry at the range of prices quoted last week. The following are the approximate quotations for the local market, cash, f.o.b. Cincinnati:

Hot-Blast Foundry.	
Southern Coke, No. 1	$17.50 @ $18.50
Southern Coke, No. 2	16.50 @ 17.50
Southern Coke, No. 3	15.50 @ 16.00
Ohio Soft Stone Coal, No. 1	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2	15.50 @ 16.00
Mahoning and Shenango Valley	17.50 @ 18.50
Hanging Rock Charcoal, No. 1	20.50 @ 22.50
Hanging Rock Charcoal, No. 2	19.50 @ 22.00
Tennessee and Alabama Charcoal, No. 1	18.50 @ 19.50
Tennessee and Alabama Charcoal, No. 2	17.00 @ 18.00
Forge.	
Strong Neutral Coke	14.75 @ 15.00
Mottled Neutral Coke	13.50 @ 13.75
No. 1. Mill Coke	15.00 @ 15.25
No. 2 Mill Coke	14.50 @ 14.75
Car-Wheel and Malleable Irons.	
Southern Car-Wheel	20.00 @ 23.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	20.50 @ 21.50

Manufactured Iron.—There has been a fair volume of business and a stronger feeling in sympathy with the strong market for Pig Iron, but prices are without change of importance. Common Bar Iron, 1.90¢; Charcoal Bar Iron, 2.90¢ @ 3¢; Sheet Iron, Boiled, Nos. 10 to 27, 2.50¢ @ 3.25¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3½¢ @ 4½¢ ℔ lb.

Nails.—There has been a moderate demand and a steady market, but the supply is liberal of most sizes. Jobbing prices are based upon 12d @ 40d, which sell at $2 ℔ keg, with 10¢ rebate in carload lots, at mills. Steel Nails sell at $2 and Steel Wire Nails at $2.65 @ $2.75 ℔ keg

Detroit.

WILLIAM F. JARVIS & Co., under date of September 10, report as follows: The market continues active and very strong. Several large sales of Lake Superior Charcoal have been made during the week at from 50¢ to $1 ℔ ton higher than ruling prices in July and August. The majority of the Mahoning Valley furnaces are refusing orders unless at $1 ℔ ton advance, and some are not in position to fill orders promptly even if price is satisfactory. Silvery Irons have been the slowest in putting up their prices, but they too have finally decided to ask an advance of 50¢ ℔ ton. The fact that several parties have been seeking Iron for speculative purposes and made some few purchases, has strengthened the market, and very little, if any, Iron is now to be found at less than regular prices. With a strong market we quote as follows:

Lake Superior Charcoal, all numbers	$20.00 @ $20.50
Lake Superior Coke, all ore	19.75 @ 20.25
Lake Superior Coke, cinder mixed	18.50 @ 19.00
Standard Ohio Black Band	19.75 @ 20.25
Southern No. 2	17.75 @ 18.25
Southern Silvery	17.00 @ 17.50
Southern Gray Forge	16.25 @ 16.75
Jackson County (Ohio) Silvery	18.50 @ 19.00
Old Wheels	20.00 @ 20.50

Cleveland.

CLEVELAND, September 10, 1888.

Iron Ore.—If the mine owners could be guaranteed a sufficient advance in the price of ore to cover the increased cost of lake transportation, arrangements would undoubtedly be made for a heavier output than is now contemplated. The demand for ore unquestionably warrants an increase in mining operations, but quotations do not keep pace with the demand. Furnacemen seem disinclined to pay much more money for ore than has been paid for the bulk of their season's purchases. A number of buyers are known to have declined offers for ore with full cost of lake freights included. The efforts of the mine owners seem to be directed just at present to an effort to keep pace with the advancing lake freights. But while the cost of transportation is about 50 ¢ ℔ ton greater than at the beginning of the season, quotations for ore have advanced only from 20¢ to 40¢ ℔ ton, a very few high grade ores having increased in value 50¢ ℔ ton. Scattering sales of Gogebic Bessemers at $3.25 are reported, and additional transactions in No. 1 Specular and Magnetic ores at $6.25 have occurred. The lake shipments to date are slightly in excess of 2,900,000 tons. Up to a corresponding period last year 3,150,000 tons had been shipped.

Pig Iron.—The demand for all brands of Pig Iron continues in excess of the production. Prices have also improved, Foundry and Bessemer Irons being especially strong. Mill Irons are quoted at an advance, the inquiry even at the higher figures being quite heavy. Sales of Mill Iron at $16, of No. 1 Foundry at $17.50, and No. 2 Foundry at $16.75 are reported.

Manufactured Iron.—Bar Iron in round lots brings $1.65, a sale of 1200 tons at that figure having occurred during the week.

Sheets.—No. 24 is now quoted at $2.85. Common Sheets are hard to obtain and cannot be purchased for delivery within 30 days.

Scrap Iron.—Old American Rails have suddenly advanced to $25 per ton, at which figures they are firmly held. Wrought Scrap is eagerly taken at $19 @ $19.50.

Louisville.

LOUISVILLE, KY., September 10, 1888.

Pig Iron.—Business during the past week has been fair, and buyers have been compelled to pay market prices, furnaces not finding it necessary to make concessions at all. There is a feeling among buyers that the coming week will decide whether the market is to decline or another advance be made, and that the position of the Eastern market will largely decide this. Furnaces consider this question already settled, as they report an advance as having already taken place in that section, and that Iron cannot be sold East that will net them more money than the West offers. If this improvement is permanent buyers here will find it to their interest to make purchases at once, as indications point to a slight advance in the immediate future.

Southern Coke, No. 1 Foundry	$17.00 @ $18.00
" No. 2 "	16.00 @ 16.50
" No. 2½ "	15.50 @ 16.00
Hanging Rock Coke, No. 1 Foundry	17.25 @ 17.75
Hanging Rock Charcoal, No. 1 Foundry	21.00 @ 23.25
Southern Charcoal, No. 1 Foundry	18.00 @ 18.50
Silver Gray, different grades	14.50 @ 15.25
Southern Coke, No. 1 Mill, Neutral	14.75 @ 15.25
" No. 2 " "	13.75 @ 14.75
" No. 1 " Cold Short	14.25 @ 14.75
" Charcoal, No. 1 Mill	15.75 @ 16.50
White and Mottled, different grades	13.50 @ 13.75
Southern Car-Wheel, standard brands	23.00 @ 24.00
Southern Car-Wheel, other brands	19.25 @ 21.25
Hanging Rock, Cold Blast	22.25 @ 25.25
Hanging Rock, Warm Blast	19.25 @ 20.25

Old Rails—are stronger, sales having been made at $23 and $23.25, f.o.b cars Louisville, and offers on basis of these figures have been made for large amounts to be delivered during the remainder of the year.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, September 12, 1888.

American Pig.—The feeling among producers and dealers is growing more and more hopeful, and some sellers claim to be getting an advance of about 50¢ a ton, especially on choice No. 1 Foundry Irons. Still, the Thomas Iron Company are selling quite freely at the old figures, Mr. B. G. Clarke reporting sales in blocks of 1000 and 2000 tons, or 8000 tons during the week. He estimates that of this year's probable output of the company about 20,000 tons still remain unsold. Comparatively little is heard of Southern Irons, representatives of producers here stating that their principals are doing better in the West. From that quarter, however, come reports that the Eastern market is relatively the most favorable to Southern furnacemen. These conflicting claims have been the subject of some comment in the trade of late, though they are by no means a new feature. In Mill Irons New York has long ceased to be a market of any consequence, but it is a feature worthy of note that inquiries for a 1000-ton lot have come here from Pittsburgh during the past week. We quote standard Northern No. 1 Foundry, $18 @ $19, the latter for choice quality; No. 2, $17 @ $17.50, and Gray Forge, $15.75 @ $16.25. Our monthly furnace report, published elsewhere, shows little change among the Anthracite furnaces, but an increase in the Coke furnace capacity of about 6000 tons weekly.

Scotch Iron.—There has been a continuance of the advance, due chiefly to a rise from 4/ to 10/ in steamer freights, which, it is surmised, is due to an agreement between the two lines. On the rise importers have sold freely, and they are asking for Coltness from $21 to $22, Shotts, $20 to $20.50, Langloan and Dalmellington, $19.75 to $20, it being claimed by some that the lower figures named do not cover cost of importation. It remains to be seen to what extent these prices will curtail consumption. Founders in the West have long learned to get along without foreign Scotch, and it would appear that the time has arrived when even those in the East most persistently clinging to time honored mixtures should make efforts to make themselves independent of foreign Iron.

Structural Iron.—The trade is moderately active and the outlook is regarded as flourishing, but as yet no quotable advances have taken place. We quote for round lots, on dock: Sheared Plates, 2¢ @ 2.10¢; Universal Mill Plates, 2.1¢ @ 2.15¢; Angles, 2.1¢ @ 2.15¢; Tees, 2.5¢ @ 2.7¢ and Channels and Beams, 3.3¢.

Plates.—A moderate amount of business is reported, with a firmer feeling prevailing, Western sellers, particularly, dwelling upon the advance in Raw Materials. We quote for round lots, on dock: Iron Tank, 2¢ @ 2.10¢; Shell, 2.25¢ @ 2.4¢; Steel Tank, 2.25¢ @ 2.3¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.65¢ @ 3¢, and Fire-Box, 3.5¢ @ 4¢. Galvanized Sheets are 65 % @ 65 and 5 %.

Steel Rails.—The only sale of any magnitude reported by Eastern mills is a lot of 8000 tons to a Southern road, at private terms. The condition of the market remains practically what it has been for some time past, and no movement of winter work has yet taken place. The sales by all the mills during August are reported to have aggregated about 72,000 tons, bringing the total to September 1st up to about 1,060,000 tons, and leaving about 200,000 tons of the allotment still to be sold, while the deliveries up to September 1st were about 824,000 tons. It is worthy of note that reports from England indicate that the old International Rail Association has now been revived. This practically means that the English, French, German and Belgian mills have parceled out the world's markets with the exception of our own. Representatives of foreign mills in this country profess that they are not yet advised of the conclusion of the negotiations, which, it is well known, have been pending for some time. The fact may be recalled in this connection that one of the severest blows the old syndicate suffered was the capture of a Canadian order by an American mill at a time when domestic competition had driven prices in this country to their lowest point. We continue to quote $28.50 @ $29 at Eastern mill.

Wire Rods.—What inquiries are in the market are claimed by importers to be coupled with prices which they cannot think of accepting, especially in view of the rise in freights, which are quoted 10/6 @ 11/. This more than neutralizes the lowering of the foreign prices, which are on the basis of 103/ @ 104/, f.o.b. shipping ports, 97 marks dutiable value. We quote $39.50 @ $39.75

Old Rails.—Orders for Old Rails, both for consumers and on speculative account, are numerous but cannot be filled, since holders ask prices which buyers have not yet approached. They ask $24 @ $24.50 for Tees and $24.50 @ $25 for Double Heads, and even at these figures they are not offered firm. For shipment $25 is the

best that can be done, inquiries sent abroad for a 2000-ton lot not even having met with a response. It is reported that $25 has been bid for 2000 tons Tees delivered West, and has been declined. The New Haven Railroad is asking for bids on a lot of 1000 tons of Tees, delivered at New Haven or Bridgeport, the bids to be opened on the 15th inst.

Scrap.—During the past two weeks an active business has been done and the bulk of the stock in the smaller yards has been exhausted at prices ranging from $18.50 to $19. Since then a lot of 500 tons has been sold at private terms, and an order for 600 tons is now in the market. The larger yards ask from $20 to $21 now.

Fastenings.—The market is fairly active and firm with Spikes selling at $2.15 @ $2.20, and Angles at 2¢ @ 2.05¢. The Ames works at Jersey City are to be started again. Dilworth, Porter & Co. are still idle.

Axles.—We quote 2.15¢ @ 2.30¢ for Scrap Axles and 2.4¢ @ 2.5¢ for Muck Bar Axles.

Coal Market.

The Anthracite Coal market is quiet compared with the high-pressure times that preceded the recent advance. Nevertheless a large business is in progress, and the means of transportation are taxed to their full limit in forwarding Coal from the mines and in filling orders received previous to September 1. There is not the same eagerness manifested in placing orders at the new schedule rates, and it is not expected that the business of the present month will be equal in volume to that of August, which is already recognized as the banner month in the history of the trade, but it is possible that cold weather will act as a healthy stimulus. Prices, it is claimed, are held with little or no concession, some of the companies being already pledged for an amount of Coal equal to their entire production for the rest of the month, and therefore decline to assume new obligations. Fortunately for manufacturers the small steam sizes are in excessive supply, and buyers are in a position to dictate their own terms. New York prices are as follows:

	Broken.	Egg.	Stove.	C'nut.
Hard white ash	$4.15	$4.40	$4.65	$4.55
Free white ash	3.95	4.20	4.65	4.55

Production at the mines is again on the ascending scale, the total for the week ending September 8 being 881,802 tons, a figure rarely surpassed. Compared with the previous week this is a gain of 37,000 tons, and, compared with the corresponding week last year, 153,000 tons The gain is almost entirely from the Lehigh region. Since January 1 the aggregate is 24,858,891 tons, an increase of nearly 1,500,000 tons, compared with 1887. The Philadelphia *Inquirer* says the total for 1888 will be about 36,000,000 tons, or more than double the output ten years ago: The output for several weeks past is as follows:

	Tons.
Week ended August 4	754,883
Week ended August 11	831,615
Week ended August 18	920,922
Week ended August 25	832,058
Week ended September 1	844,665
Week ended September 8	881,802

The Reading's Monitor Colliery was seriously damaged last week by an explosion, and a serious mine fire broke out in one of Pardee Brothers' collieries, near Hazleton. The New York, Ontario and Western Railroad is about to connect the Coal mines at Carbondale with its line at Hancock, and it is said that the Delaware and Hudson Canal Company alone will send 750,000 tons of Coal annually over the road.

The Bituminous Coal trade is fairly active and prices are sometimes cut as a consequence of free receipts. Shipments from the Cumberland region for the week were 76,776 tons, and since January 1, 2,341,339 tons, an increase of about 250,000 tons, compared with 1887.

Financial.

Advices from all quarters indicate a steady improvement in all the conditions affecting trade, and an active movement in the distribution of merchandise has fairly commenced. The speculative markets are unusually sensitive and almost without exception are higher. Wheat, cotton, sugar, lard and coffee are all up. Petroleum is strengthened by the formation of a pool to control production. Sluggishness in provisions is attributed to restricted markets, caused by yellow fever in the South. Local jobbers in the grocery trade notice an excellent demand from interior points, and the dry goods jobbing trade report a large business in progress, here and throughout the country, characteristic of what may prove to be the banner week. Of trade in the West a Chicago contemporary says the recent marked improvement is fully sustained and confidence in the future is unabated. Another says: "The summer has closed with the preponderating influences more favorable to commercial prosperity than at any time since the close of May. Tendencies, indications and prospects are construed by thoughtful, intelligent business men to mean prosperity." The unusually large corn crop, much of which is already being harvested, is generally recognized as the basis of the confident tone prevailing in trading circles. The railroads, it is predicted, will have their carrying capacity fully taxed during the next few months, but the fierce rivalry of competing lines may prevent their taking full advantage of an opportunity to increase their revenues. East of Chicago the lines, it is believed, have no ability to maintain uniform rates.

The Stock Exchange markets have been active and irregular, but generally firm. On Thursday it appeared that the three weeks' rise in prices had come to a halt, but on Friday there was a rally on the report that differences between the shippers and the Iowa companies would be arranged. On Saturday there was another upward movement, the closing sales showing considerable gains during the week. The bank statement caused a slight sensation. On Monday there were rumors from the West of further interference with established rate tariffs by State commissioners, and the decreased earnings of the Atchison road had some effect. Coal stocks reached the highest point of the year, Lackawanna the highest in six years.

United States bonds are quoted as follows:

U. S. 4½s, 1891, registered	106¾
U. S. 4½s, 1891, coupon	106¾
U. S. 4s, 1907, registered	128¾
U. S. 4s, 1907, coupon	129¼
U. S. currency 6s	121

The weekly bank statement reflected the large drafts upon their funds in moving the Western crops, their reserves showing a loss of $4,920,500. The surplus now stands at $11,846,425, which is still much larger than at the same time last year. Loans increased $1,008,200, specie decreased $3,941,700, legal tenders decreased $2,168,900, and deposits decreased $4,760,400, and there was a slight hardening in the rates for money. Time loans were made chiefly by out of town institutions at 3 @ 3½ % on collaterals for three months, and 4 @5 % for longer dates. The failures of the week include the old firm Charles Vogt & Co., importers of china and glassware.

The Secretary of the Treasury purchased $4,000,000 of the registered 4 % at 129, and $2,150,000 of the 4½ % at 106¾. These are prices fully ¼¢ above the market prices of the previous week. Since April 21 there have been purchased of 4 % $27,273,250, and of 4½ % $12,744,300; total $40,017,550. Although a contraction of $27,700,000 has occurred during the past 12 months in the national bank note circulation, only $11,800,000 of this amount has been due to the withdrawal of bonds deposited with the Treasury as security, showing that the banks reluctantly part with their bonds.

Sterling exchange is dull and steady at $4.85½ @ $4.88½.

The Government crop report was an important factor in the speculative markets and was immediately felt. Winter wheat turns out rather better than had been expected, and spring wheat somewhat worse. The percentage for the whole crop is 77.3, which the most careful estimate as representing 413,000,000 bushels, against 418,000,000 bushels last month. Spot wheat and spot corn dropped about ½¢ @ ¾¢, and new crop grades of flour were 5¢ @ 10¢ ₱ barrel lower than on Saturday. Wheat was again off on Tuesday 1½ @ 2 %. The report made the average of cotton 83.8, a condition more favorable than was expected, and spots were firm at 1/16¢ advance. Corn was stronger on an unusually good export demand. Wheat exports are restricted by lack of cargo space and the recent extraordinary advance in ocean rates, equal to 10¢ @ 11¢ ₱ bushel.

The imports and exports at New York for August alike show a falling-off compared with last year. The former amounts to $35,736,829 or $8,500,000 less in merchandise and $5,500,000 less in specie than for the month of August last year. The exports for the month amounted to $26,127,098 or $3,603,239 less than during August last year. High rates for ocean tonnage and enhanced cost of the leading export staples account in part for the difference. For eight months the exports exclusive of specie amount to $192,912,000, a decline of nearly $11,000,000 compared with the same time in 1887. Owing to the lessened imports the unfavorable balance of trade for the entire country reported for the first seven months—viz., $55,500,000—will be reduced several millions by the August statements.

According to the Custom House report the exports of specie from this port for the week amounted to $211,000, and the imports were $171,000. Since January 1 the totals are $27,146,000 and $6,000,000 respectively. The imports of merchandise at this port during the week amounted to $7,816,000, of which $2,500,000 represents dry goods, and the aggregate since January 1 is $324,288,000, as compared with $325,958,000 for the same time last year and $302,011,000 in 1886.

Imports.

The imports of Iron and Steel, Hardware, &c., at this port from August 31 to September 6, inclusive, and from January 1 to September 6, inclusive, were as follows:

Iron and Steel.

	Aug. 31 to Sept. 6. Tons.	Jan. 1 to Sept. 6. Tons.
Pig Iron: N. S. Bartlett	300	4,100
James Williamson & Co	200	3,800
Naylor & Co	180	6,164
G. W. Stetson & Co	100	12,050
Pratt, W. & Co	10	10
Spiegeleisen: Crocker Bros	104	3,521
Naylor & Co	100	6,919
Geisenheimer & Co	65	135
Steel: J. Abbott & Co	75	440
W. F. Wagner	18	1,083
M. Cohn & Co	12	190
F. S. Pilditch	9	321
J. S. Leng's Son & Co	8	8
G. Lundberg	5	106½
Chas. Hugill	5	212½
C. F. Boker	3	175½
A. R. Whitney & Co	2	2

Steel Rods: Dana & Co.	500	2,550
Naylor & Co.	498	14,755
J. A. Roebling's Sons.	54	1,259
Pierson & Co.	21	21
Cary & Moen	10	660
R. H. Wolff & Co.	4	2,991
Steel Sheets: R. Crooks & Co.	23	313
Pierson & Co.	12	848
Naylor & Co.	5	473
Steel Bars: Naylor & Co.	1	372
Steel Forgings: Thos. Prosser & Son	50	3,498½
Steel Crop Ends: Naylor & Co.	419	2,359
Steel Rails: Delaware, L. and W. R. R. Co.	54	202
Iron: J. Abbott & Co.	100	6,663½
J. S. Leng's Sons & Co.	2	2
R. F. Downing & Co.	1	105
Rivet Rods: J. Abbott & Co.	226	3,255
Naylor & Co	100	371
A. Milne & Co.	6	310
Wire Rods: J. A. Roebling's Sons	63	149
Iron Rods: R. F. Downing & Co.	55	55
Swedish Bar Iron: C. v. Philp	40	128
Sheet Iron: T. B. Coddington & Co.	53	1,038
Swedish Wire Rods: C. v. Philp	1	4
Swedish Rough Bars: C. v. Philp	1	1
Charcoal Iron: A. Milne & Co.	41	56
Iron Girders: W. H. Wallace & Co.	86	295
Oil Bbl. Hoops: A. R. Whitney & Co.	100	300
Cotton Ties: Bullard & W.	300	945
J. S. Leng's Son & Co.	125	285

Tin Plates.

	Boxes.	Boxes.
Phelps, Dodge & Co.	12,856	375,307
A. A. Thomsen & Co.	8,207	89,772
Dickerson, Van Dusen & Co.	7,219	190,358
Pratt Mfg. Co.	3,895	124,459
T. B. Coddington & Co.	3,678	122,313
N. L. Cort & Co.	2,754	75,039
Bruce & Cook	2,678	72,700
Central Stamping Co.	2,073	24,050
G. B. Morewood & Co.	1,750	33,689
S. Shepard & Co	1,718	15,653
R. Crooks & Co.	1,580	49,441
H. R. Demilt & Co.	805	15,124
Lalance & G. Mfg. Co.	432	3,810
E. S. Wheeler & Co.	331	4,984
Somers Bros.	140	440
Merchant & Co.	129	16,612

Metals.

	Pounds.	Pounds.
Tin: Phelps, Dodge & Co.	149,603	1,483,917
D. Thomsen & Co.	22,435	181,458
Spelter: American Metal Co	56,000	554,163

Hardware, Machinery, &c.

Boker, Hermann & Co., Mdse., cs., 7; Hdw., cs., 13; Arms, cs., 31
Central Gas Light Company, Ironwork, pkgs., 71
Downs, Wm., Mach'y, cs., 3
Downing, C. R., Mach'y, cse., 1
Field, Alfred & Co., Mdse., cs., 33; Hdw., cs., 13; do., cask, 1; Anvils, 46
Folsom, H. & D., Arms, cs., 4
Graef Cutlery Company, Cutlery, cs., 17
Hartley & Graham, Guns, cs., 2
Lare, J. H. & Co., Arms, cs., 13
Merentic, T. & Co., Hdw., cks., 26; Nails, kegs, 100
Pilditch, F. L., Hdw., box
Schoverling, A., Arms, cs., 12
Shoverling, Daly & Gales, Arms., cs., 11
Surville, J. L., Hdw., cks., 4; Nails, kegs, 26
Sellers, W. B., Mdse., cs., 3
Thornton, J. & Co., Hdw., cse., 1
Tryon, E. K. Jr. Mdse., cs., 12
Ward, W. H. & Co., Mach'y, cs., 36
Wiebusch & Hilger, Lim., Mdse., cs., 13; Hdw., Order: Hdw., cs., 2; ditto, cks., 2; Mach'y, pkgs., 8

Exports of Metals.

	August 31. to Sept. 6. Pounds.	Jan. 1. to Sept. 6. Pounds.
Copper: J. Abbott & Co.	.....	10,053,619
Lewisohn Bros.	.....	3,929,022
F. A. Lomal	.....	5,581,293
American Metal Company	.....	5,148,985
G. H. Nichols	.....	223,939
J. Bruce Ismay	.....	112,000
S. Mendel	.....	560,000
Ledoux & Co.	.....	110,276
Muller, Schall & Co.	.....	430,000
Copper Queen Con. M. Company	.....	224,034
J. Kennedy, Tod & Co.	.....	112,026
H. Becker & Co.	.....	1,250
Orford C. & S. Rfg. Company	.....	449,881
Robt. M. Thompson	.....	125,000
Thos. J. Pope, Sons & Co.	140,000	962,130
J. Parsons & Co.	.....	206,250
Bridgeport Copper Company	.....	112,000
C. Herold	.....	250,000
Phelps Bros.	.....	6,250
R. W. Jones	.....	189,984
W. H. Crossman & Bro.	.....	4,000
R. Crooks & Co.	1,000	1,000
Copper Matte: Williams & Terhune	.....	34,382,598
Lewisohn Bros.	.....	3,021,610
American Metal Company	.....	2,236,873
J. Abbott & Co.	.....	295,000
C. Ledoux & Co.	.....	485,800
F. W. J. Hurst	.....	184,288
G. H. Nichols	.....	722,777
H. T. Nichols & Co.	.....	180,995
Kunhardt & Co.	.....	41,652
Old Copper: Burgass & Co.	5,706	560,574

Metal Market.

Copper.—While spot Chili Bars have been active in London during the week, advancing from £95 to £105 in consequence of the covering of shorts, but receding this morning to £95, futures have remained unaltered at £79; good merchantable brands gave way from £76. 10/ to £76. 5/, and Best Selected is now £79. 10/. The total sales, 700 tons. Here, 100,000 lb were sold at 17¢ @ 17¼¢, September; 16.85¢, November, and 16.95¢, @ 17.10¢; December. A cable message from Paris states that M. Secrêtan merely wanted to give the bears a lesson and that he prefers to see the price of Chili Bars £80 @ £85, so as to encourage consumption. It is also reasserted that he contemplates the extension of contracts with Spanish producers for six years. About an extension with our mines nothing is mentioned so far. From Boston it is intimated that another sale to our manufacturers may take place a couple of weeks from now. The Boston *Transcript* figures the total product of the eight largest Lake Superior Copper mines for August at 4826 tons of mineral, against 2758 tons for the same month last year, and the total product for eight months this year at 32,945 tons, against 30,301 tons last year. It adds: This product for eight months is equal to fully 51,500,000 lb of Fine Copper, on which the net profit over all expenses must have been $3,250,000. Import of Copper into Liverpool and South Wales during the first eight months, 18,014 tons Fine, against 7512 last year. Export of Pyrites from Spain during the first six months, 418,720 tons, against 403,061 last year and 358,386 in 1886; of Precipitate, 13,541, against 13,745 and 13,396. Rio Tinto rose 21 francs in Paris last week. Spot Copper closes in New York at 17¢ @ 17¼¢ to-day.

Tin.—Spot Tin rose in London since our last report from £98 to £104, and gave away again this morning to £103. 10/, while futures advanced from £98. 15/ to £104. 10/, to recede to £104 this morning, sales, 1300 tons. This advance, being altogether speculative, has met with but little response here, as it is believed it will prove evanescent, and sales were restricted to 10 tons spot at 22.35¢; 105 tons October at 22¢ @ 22.65¢; 25 tons ditto at 22.90¢ and 10 tons September at 23¢, the spot price to-day being 23¢ @ 23¼¢. Shipments from the Straits Settlements to the United States during the first six months have been 13,377 piculs, against 43,075 in 1887, 31,533 in 1886, 16,051 in 1885, 26,651 in 1884 and 52,480 in 1883. *Tin Plates*—Have been more active and firmer on the spot, the scarcity in Coke Tins continuing, and also in certain grades of Charcoals, whereas Ternes are comparatively plentiful. Futures are in request and from 5¢ to 10¢ ₱ box higher. Liverpool has advanced with Cokes from 13/6 to 14/. We quote toward the close, large lines, ₱ box, on the spot: Siemens-Martin Steel, Charcoal finish, $4.85 @ $5.25; Coke finish, $4.75; Ternes, $4.30 @ $4.40; Bessemer Cokes, $4.60 @ $4.65, and Wasters, $4.20 @ $4.25.

Lead.—On the Metal Exchange 894 tons of Lead were sold since our last report, all the way to 5.02½¢, but nothing transpired in the way of sales to consumers, who keep aloof as heretofore, not feeling disposed or compelled to operate while this speculative purchasing continues. The chief operator is said to hold 15,000 tons at present. The closing spot price for Common Domestic to-day is 5¢; at St. Louis the price is firm at 4.80¢ @ 4.85¢. The London quotation for Soft Spanish remains £14. 2/6, and for English Pig it is £14. 5/. Spanish exportation of Lead during the first six months has been 65,040 tons, against 66,349 tons last year and 54,779 tons in 1886.

Spelter.—Ore continues advancing in the West, where Best Blende was worth last week $29 ₱ ton, and will be raised to $30 this week. The price here for Common Domestic is now 5⅛¢ @ 5¼¢, with little doing, and Silesian cannot be laid down for less than 5.80¢, since it improved in London to £18. 10/. The outlook both here and in Europe is a remarkably strong one. Spanish exportation of Calamine the first six months has been 16,601 tons, against 17,634 last year and 18,217 in 1886.

Antimony—Has been only moderately active at 13¢ Cookson and 9⅝¢ Hallett; the latter is £38 in London.

New York Metal Exchange.

The following sales are reported:

THURSDAY, September 6.

16 tons Lead, October	4.97½¢
10 tons Tin, spot	22.35¢
25,000 lb Copper, December	16.95¢
25,000 lb Copper, November	16.85¢

FRIDAY, September 7.

16 tons Lead, October	5.00¢
10 tons Tin, October	22.60¢
10 tons Tin, October	22.65¢
100 tons Lead, October	5.00¢
10 tons Tin, October	22.60¢

SATURDAY, September 8.

100 tons Lead, September	5.00¢
25,000 lb Copper, September	17.00¢
200 tons Lead, October	4.97½¢
100 tons Lead, October	5.00¢

MONDAY, September 10.

16 tons Lead, September	5.05¢
32 tons Lead, September	5.05¢
50 tons Lead, October	5.05¢
25 tons Tin, October	22.90¢

TUESDAY, September 11.

10 tons Tin, spot	23.00¢
25,000 lb Copper, September	16.85¢
32 tons Lead, October	5.02½¢
200 tons Lead, October	5.00¢
48 tons Lead, November	4.90¢

Add N Y Metal Exchange

WEDNESDAY, September 12.

25,000 lbs. Lake Copper, December	17.05¢
25,000 lbs. Lake Copper, December	17.10¢

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, Sept. 12, 1888.

There have been no really new developments in the market for Chili Bars or other Copper. Cash warrants are still kept at an extravagant point for the purpose apparently of squeezing the "shorts," but consumers can purchase supplies as cheaply now as they could a fortnight ago, and futures are no higher than last week, despite the further rise of £10 on prompts. Supplies are constantly increasing under heavy deliveries by the mining companies and the movement into the channels of consumption is very much restricted. The August deliveries to consumers were the smallest for any month in several years, and purchases at the present time are running light. G. M. B. contracts are still given good support by the syndicate, but do not appear to be traded in as freely as heretofore.

The speculative activity in Block Tin has been more prominent this week than last, and seems to be governed by the same influences that forced prices up previously. Shipments from the Straits are considerably heavier than for some time past, but neither that fact nor the probability of cost checking the consumption has any perceptible influence upon the operators for a rise. The advance for the week is about £6.

Tin Plate makers are more disinclined now than formerly to book orders except at higher prices, in view of the condition of the market for crude materials and Block Tin. The principal makers have

orders on their books that will keep them busy for some time to come. The Tynewydd Works, Pontnewydd, operating two mills, and formerly owned by E. Stanford & Co., have changed hands. The stock of Plates at all British shipping ports is 199,000 boxes, against 118,000 boxes a year ago. The British Board of Trade returns show total exports to the United States last month of 28,500 tons, against 27,450 tons in July.

The market for Scotch warrants and for makers' brands continues very strong. The latter derive no inconsiderable support from continued improvement in the sales to consumers, and the latter fact, coupled with covering of oversold account, has served to move warrants still higher. Stimulated by the active business, makers are putting more furnaces into blast. The upward movement of ocean freight rates, it is feared, will have an unfavorable influence upon export trade. It is stated that the numerous American orders at hand last week could not be filled, owing to the advance of prices of Iron and rates of freight. The exports of Pig Iron to the United States during August were only 10,000 tons, against 36,000 tons last year. The total is about the same as that for July.

There is a fairly active demand for Steel Rails, and prices continue to harden in view of the heavy orders booked latterly and the condition of the market for crude materials. The reports of an alleged combination being formed to sell at fixed rates are denied.

The demand for Old Iron Rails has further increased the past week and prices continue to harden, but show no further positive advance.

Scotch Pig.—The market continues strong and active, with a further advance in some brands :

No. 1 Coltness,	f.o.b.	Glasgow	50/
No. 1 Summerlee,	"	"	51/
No. 1 Gartsherrie,	"	"	47/6
No. 1 Langloan,	"	"	47/6
No. 1 Carnbroe,	"	"	43/6
No. 1 Shotts,	"	at Leith	47/6
No. 1 Glengarnock,	"	Ardrossan	45/3
No. 1 Dalmellington,	"	"	43/
No. 1 Eglinton,	"	"	42/

Steamer freights, Glasgow to New York, 10/ Liverpool to New York, 10/.

Cleveland Pig.—Trade has continued active, and prices are again higher. No. 1 Middlesboro', G.M.B., 37/6 @ 38/ ; No. 3 do., 35/ @ 35/6.

Bessemer Pig.—The market strong at last week's advance and quite active. West Coast brands, mixed numbers, 45/6, f.o.b. shipping point.

Spiegeleisen.—Demand is running light. Prices barely steady. English 20 % quoted 75/, f.o.b. N. W. England shipping point.

Steel Rails.—There has been a larger business at firm prices. Standard sections quoted at £3. 18/9, f.o.b. at N. W. England shipping point.

Steel Blooms.—The demand very fair and prices steady. We quote £3.15/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—A moderately active business in these at firm prices. Bessemer, 2½ x 2½ inch, £4, f.o.b. at N. W. England shipping point.

Steel Wire Rods.—The demand slow but prices held steady. Mild Steel No. 6 quoted at £5. 18/9 and No. 5 at £5. 25/, f.o.b. at N. W. England shipping point.

Steel Slabs.—Very little doing and prices nominal. Bessemer, £3. 17/6, f.o.b. at N. W. England shipping point.

Old Rails.—Market very firm with demand good. Tees quoted at £2. 17/6, and Double Heads £3, free on board.

Scrap Iron.—There is a fair business at steady prices. Heavy Wrought quoted at £2. 5/, f.o.b.

Crop Ends.—Sales fair at previous prices. Bessemer quoted £2. 7/6 @ £2. 10/, f.o.b.

Tin Plate.—Makers asking higher prices and offer sparingly. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/ @ 15/6
IC Bessemer steel, Coke finish	13/9 @ 14/
IC Siemens " " "	14/ @ 14/3
IC Coke, B. V. grade	13/6 @ 13/9
Charcoal Terne, Dean grade	13/3 @ 13/6

Manufactured Iron.—Business continues active at firm prices. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Ord. Marked Bars	....	....		@	7	12	6
" Common "	....	....		@	5	0	0
" Bl'k Sheet, singles	....	....		@	6	15	0
Welsh Bars (f.o.b. Wales)	4	12	6	@	4	15	0

Tin.—A large business done, and the market strong. Straits quoted at £103. 10/ @ £104, spot, and £104 @ 104. 10/ for three months' futures.

Copper.—Spot Chili Bars irregular. Otherwise market firm, but quiet. Chili Bars, £95 @ £100, spot, and £79 three months' futures. Best Selected, £79.

Lead.—There has been a good business, and the market is strong. Soft Spanish, £14. 2/6.

Spelter.—Prices again higher and the market strong. Silesian, ordinary, £18. 7/6.

The Thomson-Houston Motors on Street Railroads.

The Thomson-Houston Electric Company have added two new buildings to their present factory at Lynn. At the present time there are 16 roads in operation using the company's system, and the following will give a good idea of the company's new business, roads in process of construction and those just completed. The overhead constuction work at Syracuse is now completed and the cars will be in operation very soon. The road is four miles in length, and will have eight cars in operation. The Lynn and Boston Street Railway Company have decided to use the Thomson-Houston system for the Highland Line, at Lynn. The road has a large number of curves and grades as high as 9 per cent. The road will be in operation early in September, and will use the single overhead conductor and return rail circuit. The Crosstown Railway Company, of Scranton, Pa., will add four of the improved Thomson-Houston trucks, which will be put in operation this month. Work on the machinery of the Hoosac Valley Street Railway at North Adams, is being rapidly pushed forward. The road will be equipped under the Thomson-Houston system, using the single overhead conductor and return rail circuit. The track is five miles long and six cars will be operated. The Revere Street Railway's track construction was completed August 15, and the electrical work on the 16th, and cars are now running regularly. The Des Moines Broad Gauge Railway Company are to equip their seven and one-half miles of track with the same system and will operate eight cars having the latest improved trucks

The Suburban Street Railway, of Scranton, received, about two weeks ago, an improved motor truck from the Thomson-Houston Electric Company, and two more will be added very soon. The Omaha and Council Bluffs Railway and Briged Company will put in a model road, using the Thomson-Houston system. The overhead construction will be used, and the trucks containing all the latest improvements. This road, which is two miles long and on which four cars will be operated, will be one of the finest electric railways in the United States. It will be in operation by September 15. The tracks for the electric railroad at Bangor are now being laid. The Street Railway Company have decided to use electricity and have made a contract for a complete equipment. The road will use the single overhead conductor and is two miles long, and will operate 10 cars, each equipped with a 20 horse-power Thomson-Houston motor. The Seattle Electric Railway and Power Company is a corporation in Seattle, Wash. Ter., which is composed of the Seattle Street Railway Company and the West Street, Lake Union and Park Transit Company. These two companies have decided to unite their interests and equip their entire system with electricity, and have contracted with the Thomson-Houston Company for the equipment of their road. The road, which is to be in operation by January 1, is 4½ miles in length, 3500 feet double track, and will operate five cars.

Our Washington correspondent telegraphs that the Senate tariff bill will not be reported for a few days.

Deaths from yellow fever in Jacksonville to date number 90; total number of cases, 684. Some 20,000 people have left the city and it is believed that not more than 4000 whites remain at their homes. New York City is contributing handsomely for the relief of the sufferers. A single individual gives $12,000.

The Texas State Capitol building at Austin, one of the most costly structures in this country, was erected by a syndicate represented by Senator C. B. Farwell and others, who were entitled to receive as compensation 3,000,000 acres of land. The building is nearly completed, but the State authorities refuse to receive it on account of alleged defects, one of which is leakage in the massive copper dome. Architect Meyers, of Detroit, who furnished the plans says: "The contractor, G. Wilkie, of Chicago, says the dome was to have been built according to the specifications wholly of cast iron, but that changes were permitted which allowed the substitution of thin galvanized iron, cheapening the work and endangering the stability of the building. The State retains 300,000 acres of land as security for the faithful performance of the work and litigation is in prospect."

Thomas H. Hotchkiss, United States Consul at Ottawa, has sent to the State Department a review of the lumber industry of the Ottawa Valley for the past year. The export of pine to the United States from the Ottawa Valley district for 1887 was, for consumption, 227,139,959 feet, valued at $2,827,234; in bond for export, 33,698,348 feet, valued at $610,795. The total exports of pine boards and plank from all of Canada during the same year were 508,304,000 feet, valued at $6,209,023. The exports of pine saw logs to the United States from all of Canada for the same year were 2,869,000 feet, valued at $24,452. Mr. Hotchkiss says: "The figures of the export lumber trade of Canada with the United States show that if all the lumber sent into the United States from Canada was placed in the Chicago market it would supply but one-fourth of the requirements of that market alone and but one-half of the quantity handled in either Tonawanda or Buffalo."

Hardware.

Business continues to improve, and the volume of trade is now referred to as very satisfactory. Many orders are being received from the smaller trade through the country, and manufacturers and merchants are busy. There has been little change in the general aspect of the market, prices being without important alteration.

Wire Nails.

There has been no important change in the condition of the Western market, the new arrangement into which the manufacturers have entered working satisfactorily and securing the maintenance of prices. The Eastern manufacturers have made a similar advance and agreed upon the same prices as the Western. The regular quotation for small lots is $2.65 and for carload lots, $2.55. The market is thus in a decidedly improved condition, and it is hoped that the era of unprofitably low prices will be succeeded by one in which better prices will prevail.

In our issue of the 30th ult. an error occurred in the paragraph relating to Wire Nails, in which the discount was named as 10 per cent. This was so obvious an error that we presume few in the trade were misled by it. The cash discount remains as before at 2 per cent., and a full statement of the terms is as follows: Terms, 60 days' acceptance, or 2 per cent. discount for cash if paid within 10 days from date of bill of lading.

Cut Nails.

A moderate improvement in the demand is noticed in the New York market, but the prices remain unchanged at $1.85 @ $1.90 for carload lots on dock, and $1.90 @ $1.95 for small lots from store. The tendency in raw material is upward.

Miscellaneous Prices.

Machine Bolts and Bolt Ends are a shade lower in price, and there is some irregularity in the figures named by the different manufacturers.

Strap and T-Hinges are without material alteration in price and are held pretty steadily by the manufacturers. There is, however, a disposition on the part of some of the jobbing houses to offer them at concessions, which in some cases are very near the extreme price at which the goods are purchased by the wholesale trade.

The Cordage market is in a peculiar position, there being some difficulty in obtaining Rope, most of the manufacturers having shut down for want of Hemp. The general tone of the market is accordingly decidedly firm, but there is not entire uniformity in the prices named by the different maufacturers.

At a meeting of the Associated Spring manufacturers, held in Cleveland, 30th ult., an advance was made in the price of Springs. The discount was fixed at 60 and 5 per cent. from standard list, with a rebate of 5 per cent. if $750 worth is taken in any six months, or a rebate of 10 per cent., instead of 5 per cent., if $1500 worth is taken in any six months, the terms being four months, or 3 per cent. discount for cash in 30 days, with the usual delivery.

Stove Boards are in a somewhat demoralized condition, and very low prices are ruling. The competition between the manufacturers has been exceedingly animated, and it is claimed that prices are forced down below the line of profit. The trade have been purchasing largely, and it is impossible to obtain goods promptly from some of the leading manufacturers.

D. R. Sperry & Co, of Batavia, Ill., have just issued their twentieth annual price list. It is of pocket size, and contains 35 pages, illustrating and describing their goods, which consist of Caldrons, Sugar Kettles, Laundry Stoves, Farm Boilers, Mauls, Coffee Roasters, Hollow-Ware, and a great variety of miscellaneous goods made of cast iron. Their Chicago salesroom is at 235 Lake street. Their discounts are as follows, terms 90 days, or 3 per cent. if paid within 10 days :

	Per cent. off.
Caldrons, page 13	40&5
Caldrons, in lots of 5 or more, if shipped direct from factory	45&5
Castings for setting Caldrons, pages 18 and 19	40&5
Baker's Oven Castings, page 20	40&5
Sugar Kettles, page 16	50
Sugar Kettles, in lots of 8 or more, if shipped direct from factory	55
Extra Finished Hollow-Ware, pages 24, 25, 26, 27 and 28	50
Plain Hollow-Ware (Tea Kettles, Ham Boilers, Long Pans, &c.)	55
Laundry Stoves, page 9	40
The Dairy Maid, pages 10 and 11	35
Farm Boilers, pages 4, 5, 6, 7 and 8	40
Mauls, page 21	60&5
Wood Face Mauls, page 21	35
Coffee Roasters, page 23	40
Bake Ovens, Improved Covers, page 22	50&5
Drug Mortars, page 30	30
Felloe Oilers, page 28	45
Foundation Gratings, page 29	45
Miscellaneous Goods, pages 32, 33 and 34	35

The Plumb & Lewis Mfg. Company, Grand Rapids, Mich., have discontinued making the Cottage and Mystic Carpet Sweepers, and have added the Improved Parlor Queen, nickeled and japanned, and the Excelsior. They issue circulars relating to these goods and their line of Wringers, on which prices are named as given below:

Carpet Sweepers.

	Per dozen.
Improved Parlor Queen, nickeled	$27
Improved Parlor Queen, japanned	24
Parlor Queen	24
Excelsior	22
Garland	18
Housewife's Delight	15

Wringers.

Gem Bench Wringer	52
No. 4 Bench Wringer	48
No. 5 Bench Wringer	45

Pratt & Co., Elmira, N. Y., announce a new Hanger, named the May. It is made entirely of steel, with the exception of the wheels, which are V-shaped for preventing friction. The point is made in regard to it that it cannot be thrown from the track, and other advantages possessed by it are referred to. It is sold at discount 50 and 5 to 50 and 10 per cent.

In our issue, 23d ult., we had occasion to call attention to an error of the compositor in the Alford & Berkele Company's advertisement, in which the discount on IXL Shells was named as 40 and 50 per cent. instead of 40 and 5 per cent., the correct figure. By some inexplicable mistake the advertisement appeared in our last issue with the same erroneous quotation. Fearing that some may have been misled by this repeated error we desire to remind the trade emphatically that the correct discount is 40 and 5 per cent. We much regret the trouble thus caused the company and their customers.

The following price list of the Triumph Wire Chain manufactured by the Bridgeport Chain Company, Bridgeport, Conn., and adapted especially for hanging pictures, is subject to a discount of 40 and 10 per cent.:

Size.	
No. 0, Brass, Lacquered (tensile strength, 125 pounds)	$1.75
No. 0, Brass, Nickel-Plated (tensile strength, 125 pounds)	2.50
No. 1, Brass, Lacquered (tensile strength, 160 pounds)	2.00
No. 1, Brass, Nickel-Plated (tensile strength, 160 pounds)	2.75

The following are the prices of the line of Wringers manufactured by the Empire Wringer Company, Auburn, N. Y. The Volunteer and Daisy Wringers are listed as follows, with an abatement of $2.50 per dozen from the prices named:

Volunteer Double Cog Wringer.

	Per dozen.
Size 10, Rolls, 10 x 1¾	$27.00
Size 11, Rolls, 11 x 1¾	31.50
Size 12, Rolls, 12 x 1¾	36.00

The Daisy Wringer.

	Per dozen.
Size 2, Rolls, 10 x 1¾	$22.50
Size 4, Rolls, 12 x 1¾	31.50

The Empire Purchase Gear and Empire Bench Wringers are sold from the following list, net:

The Empire Purchase Gear Wringers.

	Per dozen.
Size 3, Rolls, 10 x 1¾	$36
Size 4, Rolls, 11 x 1¾	48
Clamps for round or set tubs, as desired.	
Size 5, Rolls, 12 x 1⅞	60
Size 12½, Rolls, 12 x 1⅞ (special)	72
Size 50, Rolls, 12 x 1⅞ (special)	63
Size 14, Rolls, 14 x 2¼ (crank)	126
Size 14, Rolls, 14 x 2¼ (pulleys)	162
Size 16, Rolls, 16 x 2½ (pulleys)	222

Empire Bench Wringers.

	Per dozen.
Size 3, Rolls, 10 x 1¾	$51
Size 4, Rolls, 11 x 1¾	60
Size 5, Rolls, 12 x 1⅞	72

A New Departure.

A movement which has for some time been under consideration, and which is of general interest to the Hardware trade as being in some respects a new departure, has been at last consummated. H. C. Marshall, who has been associated for a number of years with Clement M. Biddle, has been engaged by a number of large wholesale Hardware houses as their resident buyer, his office being at 110 Chambers street, in this city. Leading houses of St. Louis, St. Paul, Cnicago, Pittsburgh, Cleveland, Boston, Philadelphia and other points are thus represented. Much of the significance of this syndicate or arrangement is in the fact that these houses are among the very largest in the country, with the exception of the great St. Louis and Chicago jobbers, Hibbard, Spencer, Bartlett & Co., Horton, Gilmore, McWilliams & Co., and Simmons Hardware Company It will thus be seen that Mr. Marshall represents a number of houses the aggregate of whose purchases will be very large. The object of the arrangement is stated to be to save expense by having a common representative with headquarters in this city, and branch offices in one or two leading manufacturing centers, while at the same time it is anticipated that the aggregate of the orders of these houses will secure them the most advantageous terms in the purchase of their goods. The fact that all the houses thus united in the arrangement for the purchase of their goods are among the largest in the country, and occupy, as nearly as may be, positions of equal prominence, entitling them to the best prices, is referred to as avoiding some of the mischiefs connected with so-called syndicate buying, in which smaller houses sometimes obtain prices to which they are scarcely entitled. Another objection which the manufacturers have felt to arrangements somewhat similar is removed by the fact that in this case the goods purchased by their representative are charged in all cases directly to the several houses, thus permitting the manufacturer to have direct dealings with the parties who handle his goods. It is expected by those interested in this movement that the combination of the orders of these houses will enable them to secure the most favorable terms from manufacturers, lower, it is hoped, in some cases, than can be obtained by any of their competitors, and that at the same time the manufacturers will not regard the movement with especial disfavor, but will be, on the other hand, desirous of securing the orders of these associated concerns.

Export Trade.

The recent mails from Australia are referred to as bringing very satisfactory orders for American goods, and the gradual, and in some markets marked, increase of our business is noted with satisfaction. We give below some data in regard to recent shipments from this port, which will indicate the character of goods which are being sent abroad and the houses through whom they are exported:

PER BRIG WAN BUN, AUGUST 31, FOR CAPE TOWN, AFRICA.

By W. H. Crossman & Co.—10 dozen Axes, 2 cases Hardware.

By Arkell & Douglas.—1 Refrigerator, 6 dozen Churns, 3 Lawn Mowers.

By R. W. Forbes & Co.—47 packages Carriage Woodwork, 2 dozen Forks, 8 dozen Hatchets, 56 dozen Handles, 1 package of Hardware.

By M. Berliner.—3 packages Blocks, 53 pounds Twine, 24 Stoves.

By Henry W. Peabody & Co.—1120 pounds Rope, ⅛ dozen Grindstones, 10 dozen Handles.

By W. B. Fox & Bro.—400 pounds Wood Handles, 750 pounds Hareware.

By New Home Sewing Machine Company.—4 boxes Sewing Machines.

By Coombs, Crosby & Eddy.—10 cases Weights, 1 case Cord, 50 sets Bows, 2432 Spokes, 9 cases Axle Grease, 600 pounds Nails, 6 dozen Wood Faucets, 1 case House Furnishing Goods, 15 dozen Handles.

PER BARK PEERLESS, SEPTEMBER 1, FOR PORT NATAL, AFRICA.

By W. H. Crossman & Co.—1050 pounds Sash Weights, 76 pounds Cord, 24 cases Plow Parts.

By J. A. Gifford.—1 barrel Hardware, 2 packages Carriage Woodwork.

By R. W. Cameron & Co.—54 cases Plows.

By Corner Bros. & Co.—60 cases Agricultural Implements, 22 barrels Hardware, 96 cases Hardware, 51 cases Agricultural Implements.

By H. W. Peabody & Co.—11 cases Agricultural Implements, 2 cases Hardware, 30 dozen Shovels, 10 cases Agricultural Implements, 16 cases Edge Tools.

By Coombs, Crosby & Eddy.—7 Pumps, 2 dozen Tools, 2 dozen Picks, 30 dozen Hammers, 100 pounds Nails, 3 dozen Carriage Ware.

By Marcial & Co.—2 dozen Axes, 2 dozen Picks, 11 dozen Hammers, 30 dozen Shovels.

PER BRIG ELECTRIC LIGHT, SEPTEMBER, 6, FOR EAST LONDON.

By Arkell & Douglas.—12 cases Plow Parts, 1 case Castings, 1¼ dozen Whip Stocks, 48 Plows, 5 cases Hardware, 2 cases Tacks, 9 dozen Bits, 1 dozen Churns, ½ dozen Lawn Sprinklers, 24 dozen Saws, 9 dozen Knives, ½ dozen Scales, 8½ dozen Axes, 1 case Whetstones, 8 dozen Axes, 2 cases Saws, 1 case Fret Saws, 22 Blocks, 1 dozen Drawer Knives, 16 dozen Granite Ware, 1 case Hardware, 2¼ dozen Saws, 2 dozen Apple Parers, 1 case Hinges, 3½ dozen Gas Fixtures, 10 dozen Bits, 2 crates Washers, 1 dozen Hatchets, 6 dozen Handles, 6 pairs Springs, 50 dozen Handles, 112 Plows, 1 barrel Rope, 21 dozen Axes, 500 Handles, 109 kegs of Nails, 20 dozen Handles, 18 boxes Sash Weights, 15 Hinges, 76 packages Plow Fittings, 24 dozen Hatchets, 3 Ranges, 3 packages Utensils, 1 dozen Scales, 18 Washing Machines, 132 cases Agricultural Implements.

By Corner Bros. & Co.—2 cases Agricultural Implements.

By W. H. Crossman & Bro.—10 dozen Axes, 10 dozen Hatchets, 1250 pounds Sash Weights, 183 pounds Cord, 90 cases Plow Parts, 10 Scrapers, 27 packages Carriage Ware, 10 pounds Cotton Twine.

By R. W. Forbes & Son.—9 packages Hardware, 1 dozen Wringers, 6 dozen Axes, ½ dozen Snaths, 12 dozen spades, 29 cases Nails, 16 dozen Traps, 8 sets Axles.

PER BARK CAMELOT, SEPTEMBER 8, FOR FREEMANTLE, AUSTRALIA.

By F. B. Wheeler & Co.—2 cases Castings.

By H. W. Peabody & Co.—11 cases Hardware, 160 pounds Stone, 27 cases Fire Arms, 3 dozen Egg Beaters, 5 package. Traps, 6 dozen Whips, 400 papers Nails, 12 dozen Bells, 7 cases Edge Tools, 1 case Dust Pans, 1 bundle Carriage Ware, 3 dozen Strops, 4 cases Sewing Machines, &c., 8 packages Agricultural Implements, 7 packages Windmills, 1-6 dozen Pumps, 3 cases Bolts, 43 packages Carriage Ware, 9 dozen Shovels, 550 dozen Handles, 2 packages Agricultural Implements, 5 packages Hardware, 560 pounds Castings, 36 dozen Shade Rollers, 8 1-6 dozen Pumps, 7 cases Axles, ½ dozen Primers, 1 case Agricultural Implements, 1 bundle Hardware, 7 dozen Edge Tools, 1000 Handles, 1 case Handcuffs, 1 case Drilling Machinery, 1 case Wire Goods, 5 cases Agricultural Implements, 5 cases Hardware, 1150 pounds Bolts, 6 cases Fire Arms, 2 packages Pumps, 13 packages Hardware, 2 packages Agricultural Implements, ¾ dozen Wringers, ¼ dozen Pumps, 4 packages Hardware, 1 case Agricultural Implements.

By R. W. Forbes & Son.—11 packages Hardware, 15 dozen Axes, 5 dozen Hay Forks, 127 dozen Tool Handles, 12 dozen Shovels, 1 dozen Scales, 4 packages Pumps, 6 dozen Axes, 34 dozen Handles, 4 packages Churns, 1 dozen Trucks, 8 dozen Axes, 10 packages Pumps.

By W. H. Crossman & Bro.—4½ dozen Saws, 26 packages Carriage Ware, 1½ dozen Churns, 6 dozen Scythes, 6 dozen Snaths, ½ dozen Washers, 57 dozen Cow Bells, 32 dozen Axes, 22 dozen Hatchets, 3 dozen Mattocks, 118 dozen Handles, 266 pounds Nails, 30 dozen Hay Forks, 4 Stoves, 5 dozen Stencils, 12 dozen Fly Traps, 2 gross Axle Grease, 2 dozen Guns, 7 cases Cartridges, 7 cases Hardware, 3 cases Hardware, 5 cases Carpenters' Tools.

Items.

The Cincinnati Lead Pipe and Sheet Lead Works, John D. Abraham, proprietor, 21 and 23 East Ninth street, Cincinnati, Ohio, have issued one of the most complete catalogues devoted to this line of goods which is placed at the service of the trade. It represents a varied line of Lead Pipe, Sheet Lead, Pumps, Plumbers', Steam and Gas Fitters' Supplies, Iron Pipes and Fittings, Brass Goods, Sanitary Specialties, &c. It is a volume of more than 500 pages, which is utilized in a compact and judicious display of the different goods. The cuts are for the most part of medium size, and avoid the extremes into which manufacturers and merchants sometimes fall. They are sufficiently large to represent the goods clearly, while permitting the display of a varied line in a volume of convenient size. The catalogue has a full and satisfactory index, and is substantially bound.

C. E. Hudson, Leominster, Mass., advises us that he has recently had some complaint from his Western trade that the Little Star Parer, Corer and Slicer was not what he represented it to be, and that it could be bought from certain dealers at less than he was charging for it. Upon investigation it was found that certain parties were selling the Hudson '88 for the Little Star Parer, a substitution which was possible where the parties were not acquainted with both machines. They look very much alike, but the '88 machine is inferior to the Little Star, being a cheaper machine and intended for a class of trade who are unwilling to pay the price of the Little Star. Mr. Hudson desires to remind parties intending to purchase the Little Star that the name Little Star is cast on the frame of the machine, so that the trade can easily determine whether or not they are receiving this machine.

Dauchy & Co., manufacturers of Sidewalk and Vault Lights, Chicago, having found their business outgrowing the facilities offered in their present location at 127 Indiana street, are erecting a new building on Illinois street, between Wells and Franklin streets. The building will be especially adapted to their purposes and will include a foundry for the purpose of making their own castings. Hitherto they have had this work done by outside foundrymen. The new works occupy a lot 64 feet front by 100 feet deep. The building is of brick and is of peculiar design. The front portion is five stories high, including a large and well-lighted basement. The foundry occupies a one-story extension in the rear. The front building will be used for office purposes and will also be stocked with the necessary machinery for fitting and finishing work. The new works will be ready for occupancy in about a month. The name of the firm is also to be changed to Dauchy Iron Works, for which a charter of incorporation has been secured. The officers of the new company are as follows: George K. Dauchy, president; C. H. Ross, vice-president; L. O. Dauchy, secretary; Samuel O. Dauchy, treasurer. With the advantages and increased facilities which will be enjoyed in the new establishment, the proprietors look forward to a considerably increased business.

The Goodell Company, Antrim, N. H., for whom the Alford & Berkele Company, 77 Chambers street, New York, are agents, have issued a revised catalogue of their Table Cutlery, Butcher and Shoe Knives, &c. In this list some changes are to be noted and some new patterns are represented, among which may be mentioned Nos. 1375 C, 1385 C, 2375 C and 2385 C, Table and Medium Knives and Forks. It will interest the friends of the company throughout the country to know that David H. Goodell, the president and principal stockholder of the company, is the Republican nominee for Governor of New Hampshire.

Chambers, Brother & Co., Philadelphia, have transferred their business to Chambers Bros. & Co., a corporation organized under the laws of the State of Pennsylvania. The stockholders of the new company comprise the members of the old firm of Chambers, Brother & Co., and there has been no change in the management of the business except that it will be hereafter carried on by a corporation in lieu of a partnership.

Wall Mfg. Company, Cobalt, Conn., who are well known as manufacturers of Sleigh, Hand, House and Gong Bells, have appointed J. C. McCarty & Co., 97 Chambers street, New York, their sole agents for the sale of their goods in the United States, and also for the export trade.

The Barton Bell Company, formerly of Easthampton, Conn., have removed their entire business to Marion, Ind., and have issued their illustrated price list No. 96, which shows the line of goods of which they are well-known manufacturers with the new styles and patterns lately added. In their introductory address to the trade they refer to the fact that the larger part of their product has been sold west of New York and Pennsylvania, while their raw materials, Copper, Spelter and Leather, coming from the West, they concluded that it would be in the interest of economy to establish a manufactory near the consumers and thus effect a saving of transporting the raw material from the West to New England and the finished product back again to the Western consumers. While in this way freight is saved, the saving of time is also mentioned, the company's location being now such that they can communicate by mail with the principal cities of the West in from 6 to 36 hours. The company have erected commodious buildings of stone, brick, iron and wood and have also added materially to their plant of machinery. There is a gas well in connection with the factory.

The trade will learn with regret of the sudden death, on the 3d inst., of William A. Cassell, of the well-known Hardware firm of Fillmore, Cassell & Co., Zanesville, Ohio.

Sidney Shepherd & Co., Buffalo, N. Y., and C. Sidney Shepard & Co., Chicago, Ill., call attention in their advertising space, on page 64, to the Buffalo Mincing knife, the special feature of which is that it has a double adjustment, as indicated in the illustrations.

The catalogue issued by N. R. Streeter & Co., Rochester and Groton. N. Y., is a neat phamphlet in which the different styles of Laundry Hardware are represented. In the introductory circular to the trade information is given in regard to the efforts made to secure the high qual-

ity of the goods, while the subsequent pages give detailed descriptions of the different articles, including Smoothing, Polishing and Fluting Irons, which are their leading line. Can Openers, Twine Holders, Vegetable Mashers, Ice Tools, Meat Masticators and other goods are also represented.

D. Round & Son, Cleveland, Ohio, manufacturers of Chain, Differential Pulley Blocks, &c., have appointed J. C. McCarty & Co., 97 Chambers street, New York, their agents, and we are advised that they will be at all times prepared to name the most favorable terms.

Jonn P. Lovell's Sons, Boston, Mass , in their advertisement on page 61 show, it will be observed, a variety of styles of Campaign Helmets which they are putting on the market, and these goods, although somewhat outside of the regular Hardware line, will doubtless at this time be regarded by the trade with especial interest. This feature of the company's business, though a temporary one, has already reached, we are advised, large proportions. Hibbard, Spencer, Bartlett & Co , Chicago, Ill., and the E. C. Meacham Arms Company, St. Louis, Mo., are the Western distributors of the goods.

The Chapman Manufacturing Company, Meriden, Conn., some of whose goods are represented in their advertisement on page 58, have issued a new and very satisfactory catalogue and price list of Chime Sleigh Bells, Plumes, &c., which they are putting on the market. A number of novel and attractive styles are represented in connection with the staple goods and patterns which have heretofore been on the market. The catalogue is a handsomely printed pamphlet of nearly 60 pages and is fully illustrated.

Moore & Barnes Mfg. Company, 103 Chambers street, New York, issue a circular relating to the Surprise Clothes Wringer, manufactured by the Auburn Wringer Company, Auburn, N. Y., for whom they are agents. Full and explicit information is given in regard to this Wringer, and the points which are made in its favor are enumerated.

The trade will observe among the Special Notices on page 47 one in which the stock and business of a well-known Missouri River jobbing house are offered for sale. Those who are interested in such an opportunity will find information given in regard to the trade of the city and the house, and other points tending to show the desirability of the opening. It is intimated that the house are not desirous of disposing of the stock before January 1, and by that time it can be reduced to between $50,000 and $60,000 worth. Further particulars may be obtained from William B. Fox & Brother, 97 Chambers street, New York.

F. G. Ford, Shawmont avenue, Rocksborough, Pa., issues circulars relating to some of his patented specialties, rights for which he is offering for sale. They include his combined Milk Strainer and Sprinkler, Common Sense Funnel, Centennial Milk Strainer, Hook and Socket for carriage and sleigh seats and other articles.

The St. Joseph Pump Company, St. Joseph, Mo., issue circulars describing the Perfection Water Elevator and Purifying Pump, the construction and advantages of which are explained. They allude especially to their new Cup or Bucket, which is described as made of one piece of open-hearth steel, cut out by a die and folded in shape, with double flanges and double seam. They refer also to the extent of their plant and their facilities for the prompt execution of orders for carload lots.

Our readers will observe an important announcement on page 47 in regard to the sale of the business of William A. Ives & Co., near New Haven, Conn. The opportunity is deserving the attention of those who desire such an investment.

L. Bolles Hoe and Tool Company, Binghamton, N. Y., have issued their price list for 1888–1889, in which their well-known lines of Hoes is represented. The list as given is revised to date.

It will be seen that Dame, Stoddard & Kendall, Boston, Mass., in their advertisement on page 55 show the New Acme Pattern Ladies' Skate, which is placed on the market this season for the first time. They also illustrate the American Acme Pattern Club Skate, and call attention to their complete line of Winslow's Ice Skates.

The American Tool Company have removed from 116 Chambers street to 200 West Houston street. In their old quarters they were rather cramped for room, and were compelled to seek larger accomodations. They are now in a five-story building where they have increased capacity for filling large orders for Tool Chests promptly. Attention is called to their advertisement on page 56.

J. E. Davis & Co. have succeeded Nettleton & Davis as manufacturers' agents for the sale of Hardware, at 115 Dearborn street, Chicago. J. K. Nettleton retires on account of ill health.

Steel Goods.

The market for Hoes and Forks is regarded as in an exceptionally satisfactory condition, and the fact that Wood Goods are also in good shape improves the situation. Orders are reported to be coming in freely, and it is thought not unlikely if the present condition of things continues that a slight advance may be made before very long. While no intimation is given by the manufacturers of an advance in quotations, it is considered by some well-advised parties that merchants who place their orders early will be on the safe side. We give below the standard list of the Fork and Hoe Makers' Union, in which it will be observed that a few changes have been made since the close of the past season. It will be of interest to the trade as giving them the accurate list and other points in regard to the goods. The regular discount, it will be remembered, is 65 and 5 per cent., the terms of sale being that all goods shipped between November 1 and March 1, for spring trade, shall be 60 days from March 1, or 2 per cent. discount for cash within 10 days from March 1, and on all other goods 60 days from date of shipment, or 2 per cent. discount for cash within 10 days:

Socket and Solid Shank Hoes.

	Per dozen.
Polished Cast Steel Socket Hoes, Selected Handles	$9.00
Polished Cast Steel Socket Hoes (second quality)	8.25
Polished Cast Steel Solid Shank, Selected Handles	8.00
Polished Cast Steel Solid Shank (second quality)	7.25
Polished Cast Steel Solid Shank Ladies' Hoes	6.00
Polished Cast Steel Solid Shank Onion or Nursery Hoes	7.00
Polished Cast Steel Socket Onion or Nursery Hoes	8.00
Polished Cast Steel Solid Shank Mortar or Street, 6 ft. handle, 10 in. blade	13.00
Polished Cast Steel Solid Shank, Mortar or Street, 9 in. blade	12.00
New Pattern Special Mortar Hoe	15.00
Polished Cast Steel Solid Shank California Hoes, 9 in. blade	12.00
Polished Cast Steel Solid Shank Toy Hoes	4.25
Polished Cast Steel Solid Shank Boys' Hoes, 48 in. handles, blades 5½ to 6 in., by 4 in. deep	7.00
Polished Cast Steel Solid Shank Riveted Hoes	5.25
Polished Cast Steel Socket Riveted Hoes	5.50
Washington County Solid Shank Hoes	9.00
Washington County Socket Hoes	10.00

Socket Mortar or Street and California Hoes, $1.50 per doz. additional.

Handles in Field Hoes limited to 4½ ft. in length.

Handles in Mortar Hoes 6½ and 7 ft. advance 75 cts. per foot per doz. list, and over 7 ft. advance $1 per foot per doz. list for the excess over 6 ft.

Extra for riveting or nailing punched Shanks in Hoes 50 cents per dozen list.

The cold rolled Socket and Shank Field Hoes, made by the Ely Hoe and Fork Company, list 25 cents per dozen less than regular.

Solid Shank Handled Planters' Hoes.

	Per dozen.
Polished Cast Steel Planters' Hoes, 6 and 6½ inch blades, 4½-foot handles	$9.50
Polished Cast Steel Planters' Hoes, 6½-inch blades, 5-foot handles	10.00
Polished Cast Steel Planters' Hoes, 7-inch blades, 5-foot handles	10.50
Polished Cast Steel Planters' Hoes, 7½-inch blades, 5½-foot handles	11.00
Polished Cast Steel Planters' Hoes, 8-inch blades, 5½-foot handles	11.50
Polished Cast Steel Planters' Hoes, 8½-inch blades, 5½-foot handles	12.00
Polished Cast Steel Planters' Hoes, 9-inch blades, 5½ or 6 foot handles	12.50
Polished Cast Steel Planters' Hoes, 10-inch blades, 5½ or 6 foot handles	13.50

Socket Planters' Hoes, $1.50 per dozen above list on Shank Hoes of same width of blade.

Solid Shank Cotton Hoes.

Cast Steel Cotton Hoes, 6 and 6½ inch blade, 4½-foot handles	$8.25
Cast Steel Cotton Hoes, 6-inch blade, 5-foot handles	8.50
Cast Steel Cotton Hoes, 6½-inch blade, 5-foot handles	8.50
Cast Steel Cotton Hoes, 7-inch blade, 5-foot handles	8.75
Cast Steel Cotton Hoes, 7½-inch blade, 5-foot handles	9.00
Cast Steel Cotton Hoes, 8-inch blade, 5½-foot handles	9.50
Cast Steel Cotton Hoes, 8½-inch blade, 5½-foot handles	10.00
Cast Steel Cotton Hoes, 9-inch blade, 5½-foot handles	10.50
Cast Steel Cotton Hoes, 10-inch blade, 6½-foot handles	11.50

Socket Cotton Hoes, $1.50 per doz. additional.

Weeding Hoes and Rakes.

Polished Cast Steel, 6-teeth Weed Hoes and Rakes	$9.50
Polished Cast Steel, 4-teeth Weed Hoes and Rakes	8.50
Six-teeth, Malleable Iron, Full Polished, Cast Steel Blade	5.50
Four-teeth, Malleable Iron, Full Polished, Cast Steel Blade	5.00
Polished Cast Steel, Sharp or Square Point Weed Hoes	5.75
Polished Cast Steel, Two-Prong Weed Hoes	7.00
Polished Cast Steel, Five-Prong Weed Hoes	8.00

Garden Rakes.

Polished Cast Steel,	6-teeth	Garden Rakes.	$6.00
" "	8-teeth	"	8.00
" "	10-teeth	"	9.00
" "	12-teeth	"	10.00
" "	14-teeth	"	11.00
" "	16-teeth	"	12.00

"Braced" Steel Garden Rakes advance $1.50 per dozen list.

Socket Steel Garden Rakes advance $1.50 per dozen list.

Manure Forks.

Round 4-Tine, L. H. Cast Steel Forks, Common Ferrule	$12.50
Round 4-Tine, L. H. Cast Steel Forks, Strap Ferrule	14.00
Round 4-Tine, D. H. Cast Steel Forks, Common Ferrule	13.50
Round 4-Tine, D. H. Cast Steel Forks, Strap Ferrule	15.00
Oval 4-Tine, L. H. Cast Steel Forks, Common Ferrule	12.50
Oval 4-Tine, L. H. Cast Steel Forks, Strap Ferrule	14.00
Oval 4-Tine, D. H. Cast Steel Forks, Common Ferrule	13.50
Oval 4-Tine, D. H. Cast Steel Forks, Strap Ferrule	15.00
Oval 5-Tine, D. H. Cast Steel Forks, Common Ferrule	20.50
Oval 5-Tine, D. H. Cast Steel Forks, Strap Ferrule	22.00
Oval 6-Tine, D. H. Cast Steel Forks, Common Ferrule	23.50
Oval 6-Tine, D. H. Cast Steel Forks, Strap Ferrule	25.00

Round 5 and 6 Tine Forks, same price as oval.

Long Handles on 5 and 6 Tine Forks, $1 per dozen less than D Handles.

Handles over 4½ feet on Manure Forks, advance 75 cent per foot per dozen list.

Spading Forks.

Cast Steel, 4 Flat-Tine D. H. Spading Forks, Common Ferrule	$17.00
Cast Steel, 4 Angular-Tine, D. H. Spading Forks, Common Ferrule	18.00
Cast Steel, 4 Angular-Tine, D. H. Spading Forks, Com. Ferrule, 5 lbs. less weight	17.00
Cast Steel, 4 Angular-Tine D. H. Spading Forks, Com. Ferrule, 5 lbs. less weight, blued and half polished	16.00
Cast Steel, 4 Angular-Tine D. H. Spading Forks, Common Ferrule	24.00

Extra Heavy Square Shoulder Spading Forks advance $2 per dozen list.

Long Handles on Spading Forks, $1 per dozen less than D. H.

Strap Ferrules on Spading Forks, more per dozen, $1.50.

Hay and Straw Forks.

Round 2-Tine, Cast Steel Forks, Common Ferrule	$7.25
Round 2-Tine, Cast Steel Forks, Strap Ferrule	8.75

Oval 2-Tine, Cast Steel Forks, Common Ferrule	7.25
Oval 2-Tine, Cast Steel Forks, Strap Ferrule	8.75
Round 3-Tine, Cast Steel Forks, Common Ferrule	9.00
Round 3-Tine, Cast Steel Forks, Strap Ferrule	10.50
Oval 3-Tine, Cast Steel Forks, Common Ferrule	9.00
Oval 3-Tine, Cast Steel Forks, Strap Ferrule	10.50
2-Tine C. S. Boys' or Tedding Forks, 4¼-feet handle, 8½-inch tine	6.00
3-Tine C. S. Boys' or Tedding Forks, 4¼-feet handle, 10½-inch tine	7.75

With bent handles, extra per dozen, 50 cents.

Twelve inches (as near as practicable) measured in a straight line from inside of the head to the point, is the standard length of Tine on all regular Hay.

Straw and Four Tine Manure Forks, except with the D. Handle 4 Tine Manure Forks, which may be made 13 inches.

14-inch Manure Forks shall be advanced $1.50 per doz. over the standard list.

Forks with Extra Length of Tine.

3 Tine Hay, Straw and Barley Forks.

	Per dozen.
3 Tine, 13 inch, more than 12 inch, 50 cents, making	$9.50
3 Tine, 14 inch, more than 13 inch, 75 cents, making	10.25
3 Tine, 15 inch, more than 14 inch, $1, making	11.25
3 Tine, 16 inch, more than 15 inch, $1.25, making	12.50

With Bent Handles, extra per doz. 50 cts.
With Strap Ferrules, extra per doz. $1.50.

4 Tine Hay, Straw and Barley Forks, Bent Handles.

4 Tine Hay, Straw and Barley Forks, Bent Handles	$12.50
4 Tine, 13 inch, more than 12 inch, 75 cents, making	13.25
Round or Square Shoulders, 14 inch, more than 13 inch, $1, making	14.25
Round or Square Shoulders, 15 inch, more than 14 inch, $1.25, making	15.50
Round or Square Shoulders, 16 inch, more than 15 inch, $1.50, making	17.00
Extra for riveting or nailing punched Shanks in Forks	.50
4 Tine Barley Forks, 18 inch Tine, with Guard, Bent Handles	22.50

With Straight Handles, less per dozen, 50 cts.
With Strap Ferrules, more per dozen, $1.50.

Handles in Hay, Straw and Barley Forks 6½ and 7 ft. advance 75 cts. per foot per doz. list, and over 7 ft. advance $1 per foot per doz. list for the excess over 6 ft.

Potato and Manure Hooks.

Round 4 Tine, Cast Steel Potato Hooks	$7.50
Round 4 Tine, Cast Steel Potato Hooks, Oval or half Oval	7.50
4 Tine, Cast Steel Potato Hooks, Washington County Pattern	12.00
Flat 4 Tine, Cast Steel Potato Hooks, Red and Blue Extra Finish	8.50
4 Tine, Cast Steel Potato Hooks, Diamond or Oval Back	9.50
5 Tine, Cast Steel Potato Hooks, Round or Oval	10.00
5 Tine, Cast Steel Potato Hooks, Round or Oval, Goose Neck	10.00
6 Tine, Cast Steel Potato Hooks, Round or Oval	11.00
6 Tine, Cast Steel Potato Hooks, Round or Oval, Goose Neck	11.00
4 Tine Potato Hook, Flat or Oval Back, Bent Tines, heavy	10.50
5 Tine, Malleable Iron, Round or Oval	5.50
4 Tine, Cast Steel Manure Hooks, Round or Oval, 6 ft. Handle	10.00

Second Quality Hay and Manure Forks.

2 Tine, $0.75 per dozen less than regular goods.
4 " 1.00 " " "
4 " 1.50 " " "
5 " 2.00 " " "
6 " 2.50 " " "

Second quality Forks shall be those apparently inferior to first quality goods, and shall in all cases be put on second grade handles.

Third Quality Manure Forks.

4 Tine 4¼ ft. Handles, half polish, 11½ inch Tine, Common Ferrule	$9.00
4 Tine, 4¼ ft. Handles, half polish, 11½ inch Tine, Strap Ferrule	10.50
4 Tine D Handles, half polish, 11½ inch Common Ferrule	10.00
4 Tine D Handles, half polish, 11½ inch Tine, Strap Ferrule	11.50

Turf Edgers. Clam Hooks.

Shank Turf Edgers	$9.00
Socket Turf Edgers	10.00
6 Prong Clam Hooks	12.00

Trade.

From our Louisville correspondent we have the following advices in regard to the Hardware business of that city:

The Hardware trade of Louisville, Ky., continues good in all lines, the volume gradually increasing as the fall comes on. The abundant crop yields, although realizing low prices, insure certain returns on the country merchants' calculation. This class of customers has been very cautious in buying, but frequently lately the jobbers have had good levers to work on, such as advances in Nails, Bar and Sheet Irons, Bolts, &c., all of which bear good results. With the exception of Nails, the dealers have been fully forewarned of advance, and were able to lay in good stocks, on which they are reaping nice profits. Bar Iron is holding firm from mills at last advance, and Sheet Iron is scarce at buyers' prices. This fact makes it easy to sell from store, and the demand is increasing. Barbed and Plain Wire, instead of sympathizing with other commodities, have taken another cut and are now selling at lower prices than ever known before. A sudden upward movement is looked for, yet the dealers are afraid to contract ahead for fear of still lower figures. Recent advances are being well upheld; occasionally some factory, jealous of competitor's heavy shipments, makes sly cuts to large customers, but this is rare, and firm prices rule. The retailers are having a good trade with contractors and country customers, and the House-Furnishing business, such as Stoves, Grates, &c., is beginning to be lively. The Furniture factories have about all they can attend to. There is no complaint from dealers, and the one answer from all is that business is good.

The Competition in Ciphers.

Besides lists of cipher words in accordance with the terms of the competition we are receiving also a number of answers to the problem given in our last issue, some of our correspondents at the same time expressing their views in regard to the general subject, and others explaining the manner in which the solution was reached. One of our correspondents writing from Philadelphia explains his method as follows:

The last letters of prices per half dozen, t, m, k, l, o, must be even, and the others, r, w, a, s, e, odd. The first four prices, r, w, a, s, must be greater than 1, since their products by 6 have two figures. Therefore $e = 1$ and from price of Manicure Cases $o = e \times 6 = 6$. Either k or m may equal 0, these being the only even figures which do not begin prices. But from price of Bird Seed, since $e = 1$, K must equal 2 or 8. Therefore, $m = 0$. From price of Tooth Brushes, since $m = 0$, $a = 3$, and $w = 5$. From price of Bird Seed, since $a = 3$, $k = 8$. From price of Soap, since $w = 5$, $1 = 4$ and $s = 9$. From price of Nail Brushes, since $1 = 4$, $t = 2$ and $r = 7$. The word used is, therefore, *metalworks*.

The correspondent whose letter is given below refers to the problem in the following terms:

Your correspondent in current issue of *The Iron Age* is evidently more of a mathematician than business man. His cipher is too easy. It was seen after a few minutes' examination that he sold half a dozen for just six times the price of one, which is not usual. Had he marked his goods as follows:

	Each.	Per half dozen.
Nail Brushes	r	a k
Tooth Brushes	w	t w
Bird Seed, packages	a	e o
Soap, cakes	s	w m
Cologne, bottles	o l	a t m
Manicure cases	t a e	e t t w

he would have more nearly approached a price and caused more difficulty in solving the cipher, which, as it was, was no task at all. In fact, the only catch was another business error in having the figure 0 represented by the first letter instead of the last of his cipher, as it resulted in obtaining "et(works m," instead of metal works. It is usual and more natural to count 1, 2, &c., leaving the last letter for the cipher, a person remembering the word much easier that way. Give us a harder one.

SYRACUSE.

A correspondent in Bloomington, Ill., writes as follows in regard to the competition

It seems to me that you might make your specifications a little plainer and for this purpose I beg to ask the following questions: Do you mean to restrict the list to words found in the main part of the dictionary and supplement, which give only English words and their definitions, and to exclude all proper names, Bible names, &c., which are not found in these two sections of the dictionary? Further, do you allow the use of plurals of words which are found in the two sections named above?

The spirit of the conditions which we gave in announcing this contest would exclude Bible names, proper names, &c., and all words not found in the main part of the dictionary and the supplement. We do not think that plurals are necessarily excluded. Inasmuch as our correspondent asks for supplementary instructions we can only express an opinion and cannot make this binding, for since the publication of the conditions the whole matter has been in the hands of the committee who are to determine the result. We give this simply as our own interpretation of the conditions as first presented. We trust this will be of assistance to our correspondent.

Another solution of the cipher problem is as follows, and comes from Cleveland, Ohio:

By writing down the numbers from 1 to 9 and multiplying each by 6 as follows:

$$1 \times 6 = 6$$
$$2 \times 6 = 12$$
$$3 \times 6 = 18$$
$$4 \times 6 = 24$$
$$5 \times 6 = 30$$
$$6 \times 6 = 36$$
$$7 \times 6 = 42$$
$$8 \times 6 = 48$$
$$9 \times 6 = 54$$

We see that all the even numbers, 2, 4, 6, 8, are repeated in the product when multiplied by 6, while the odd ones are not. This shows that the first four prices given are all odd numbers, as the respective letters are not repeated in the half dozen prices. We see, further, that in the half dozen prices of the first four articles the letter "l" appears twice, so by setting off the odd numbers, with their products:

$$1 \times 6 = 6$$
$$3 \times 6 = 18$$
$$5 \times 6 = 30$$
$$7 \times 6 = 42$$
$$9 \times 6 = 54$$

we find that the number 4 occurs twice; therefore "l" must be 4 and, by comparison, "$l\,t$" is 42; "$w\,l$," 54, and, by division, "r" is 7 and "s" is 9. The balance are easily found; for "$w\,l$" being 54, "w" is 5 and $5 \times w = a\,m$, or 30, and, if "$a\,m$" is 30, a is 3 and "$e\,k$" 18. This gives all the answers, except for 0, which can be found by dividing "$a\,k\,l$" or 384 by 6, giving 64, making 0 equal to 6. The price mark complete is:

M E T A L W O R K S
0 1 2 3 4 5 6 7 8 9

Trade Topics.

Relating to the arrangement of Hardware stores we have the following letter from a Pennsylvania merchant, in which he makes an appeal for more information from the smaller retailers in regard to their store methods and arrangements. While many of the contrivances which we have described have been received from the class designated, and while others can be adapted with more or less modification by this class of trade, we take pleasure in emphasizing the point made by our correspondent, and requesting contributions on this subject in accordance with his suggestion:

No doubt the readers of *The Iron Age* take great pleasure in reading the details about business and Hardware stores, as given from time to time, but it strikes me that the large dealers are generally the ones represented. I have an idea that the bulk of the retail trade throughout the country is done by the small fry. Have you no subscribers among the latter class—namely, those who do business of from $5000 to $25,000—that we do not hear from

them, and see cuts and arrangements of their stores, which run in size all the way from 12 x 20 feet to 22 x 60 feet? Think it about time to see something in print from them.

We have also the following letter in regard to the purchase of goods:

The suggestion in a recent issue as to the retailers buying direct from the manufacturer is, I think, right to the point, but it would be difficult to do it. The extras given by the jobbers for quantities are generally so large that the retailer is tempted to load up, and the result is, as stated, a large and unsaleable stock, bills due and notes the same way. Besides, the large retailer is to all appearances placed on the same plane with the exclusive jobber in the matter of buying from the manufacturer, and hence the continuous cutting in the retail trade and eventual loss and bankruptcy. Brethren of the strictly retail trade, let us hear from you.

Arrangement of Stores.

We have received from C. T. Rosenthal, Batesville, Ark., advices in regard to a method of sampling Cutlery, for which he has obtained a patent. The accompanying illustrations, Figs. 268 and 269, illustrate

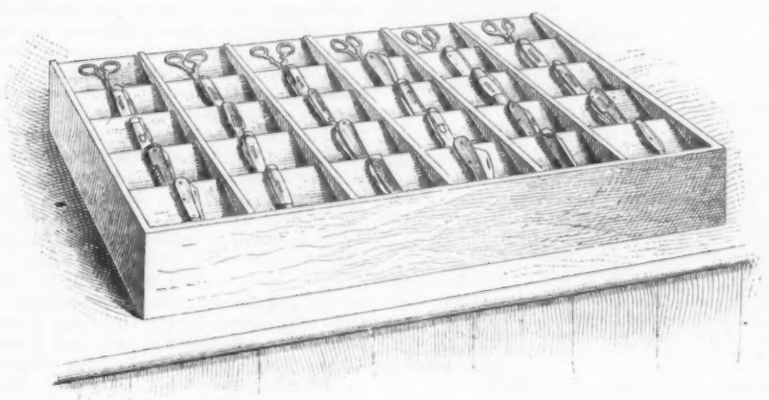


Fig. 268.—C. T. Rosenthal's Cutlery Show Case.—Front View

his method, giving different views of his Cutlery sample case. Fig. 268 showing it as seen by the customer from the front of the counter and Fig. 269 representing it as it appears to the salesman behind the counter, while at the same time it indicates the manner in which it is constructed. It should, however, be explained that the Cutlery case is intended to be used generally in a glass showcase, which is not represented in the engrav-

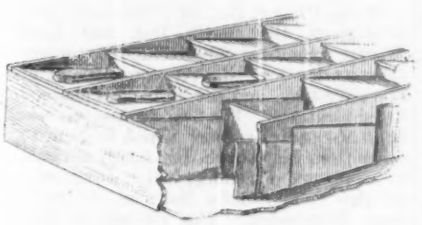


Fig. 269.—Details of Cutlery Case.

ings. From these illustrations it will be seen that the invention consists of a box or case with partitions, as shown. Each of the compartments thus formed is covered by an independent lid, on which after any desirable covering or finish has been given to it the sample of the Knife contained in such compartment is placed. These covers rest upon zinc-lined ways or supports, so that they run down toward the front of the case, so as to give a satisfactory view of the Knife. This construction provides, it will be seen, for displaying upon the cover a sample of the goods contained in each compartment, while on the exposed upper portions of the partitions, which are visible only from the rear, as shown in Fig. 269, such numbers, marks and other signs relating to the quality, cost, price, &c., of the Knives can be placed. They are thus in full view of the salesman standing behind the counter but concealed from the customer in front of it. By this ingenious contrivance it will be seen that the goods are effectively displayed. The stock is kept clean and within easy reach. It is also intimated that the customer seeing but one Knife of each pattern will usually purchase the sample, thus permitting it to be replaced by a fresh one, the accumulation of shopworn goods being thus avoided.

New Mexico is probably destined soon to be developed into a prosperous State. Various extensive railway schemes are in embryo, and, now that opportunities have been discovered for irrigating enormous sketches of land, the inducements to agriculturists are attracting many settlers. Respecting the characteristics of the country a Santa Fé correspondent says: While the climate of New Mexico may be described as everywhere mild and dry, the differences in altitude cause marked local differences in various parts, while the resources of the almost uniformly rich soil also vary materially in correspondence with the influence of the climate. The altitude gradually diminishes from north to south, from between 6000 and 8000 feet above the sea level in the northern portion for the habitable and arable regions, to between 4000 and 5000 feet in the southern parts, following the general descent of the Rio Grande and Rio Pecos. It is distinctively a mountainous country, with the unbroken chain of the Rockies descending into the northern part, below which the mountains rise from the mesas in detached groups. These mountains have the most important effect on the arability of land; were it not for these, the whole country would be almost the absolute desert it has long been reputed to be; but their summits condense the moisture and deposit it in snows on the higher peaks and in frequent rains on the slopes of all. The water breaks out in springs at their feet and descends into the plains in small streams.

By means of improved light-draft steamers with an adjustable keel adapted to shoal water it is believed that the interests of navigation on the Mississippi River can be revived, and a profitable traffic be restored. With this object the Lucas River and Ocean Ship Company have been formed at St. Louis, and a few days ago Mr. Cahill, an earnest advocate of this enterprise, addressed a public meeting, at which he stated that, while mechanics had made wonderful strides in perfecting machinery for river navigation, there had been no change in the models used in constructing the hulls. While the Lucas ship does not contain anything new, the mode of applying the old ideas, he said, will mark an era in river navigation. The trouble at present is that we have no means of reaching Spanish-American points with cheap transportation. The gentleman claimed that the Lucas ship would cover the ground, as we would be able to load a cargo at the St. Louis wharves, and not only place it aboard the wharves of the different seaport towns bordering on the Gulf of Mexico, but would be able to enter the different rivers thereby to deliver goods to interior towns. In return the ship could be loaded with all the valuable products of these tropical countries and brought direct to the interior without reshipment. It is proposed to build one of the ships to demonstrate the practicability of the scheme.

Colorado is expecting to take rank, in a very few years, among the great manufacturing States. She claims to have all the materials that can be found in the East, with every promise of a rapid growth of population. The various industries requiring iron and coal can there find the best material in inexhaustible quantity and of the best quality. The shipment of coal eastward this year, as far as the Missouri River, will equal 500,000 tons. The wool clip in 1887 was about 8,000,000 pounds, and that of 1888 will exceed 12,000,000 pounds. The means of transportation in Colorado comprise 20 lines of railroad, and reach every portion of the State. The Denver and Rio Grande, the greatest narrow gauge system on the globe, operates over 1500 miles, its connections reaching all points abroad. The Colorado Midland, a new standard gauge road, affords transit from the center of the State to the Northwest. The systems of the Union Pacific, Kansas Pacific, Burlington and Missouri, Atchison, Topeka and Santa Fé and the Missouri Pacific all traverse the State. Within the past few weeks has been witnessed the completion of the Pan Handle route from Denver to the Gulf of Mexico, opening up to Colorado the markets of the great South.

The removal of the $50,000 subsidy to the Australian line of steamships by Postmaster-General Dickinson causes much rejoicing in San Francisco, where it is predicted that in a very few years the line will be self-supporting. The *Commercial Herald* says: "Our commerce with the Australias is increasing at a rapid pace. It now not only employs the steamship line, but a flourishing line of clipper ships, and it will not stop where it is now by any means. For seven months of the year the imports from Australia and New Zealand have reached $801,680; the exports, $983,900—close on $1,000,000. The latter in particular is very nearly equal to the whole exports of 1887, so that our trade is improving in the most desirable direction. The complete figures for the present year will far exceed those for 1887, or, we believe, for the matter of that, any other year in the history of the trade. For all this we are certainly indebted to the subsidy so liberally paid by the colonies until now. We hope that for the future we shall be able to subsidize our own vessels, if need be, with or without the aid of the colonies, whose trade we so ardently desire.

The *West Shore*, a monthly magazine published at Portland, Ore., prints a supplement illustrating and describing the charcoal furnace and the pipe foundry of the Oregon Iron and Steel Company at Oswego, Ore.

Foreign Markets.

EQUIVALENTS

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds.
Kilogram	220.5
Picul	134.

EAST INDIES.

SINGAPORE, July 11, 1888.—*Tin.*—Some small sales were made here at down to $29.75 ℔ picul, but the advance in London has revived the hopes of holders, and no sellers could be found except at fancy prices. Buyers offer $31 and under. Supplies are being kept back and shipments will again be very small. *Tonnage.*—Steamers get 27/6 @ 30/ for weight. Via canal there is no tonnage offering; via Cape the Macca Company quotes 22/6 @ 25/ for weight. For Boston the berth is vacant. *Exchange*—is quoted 3/1⅛ for 6 months' sight credits. The Laertes, a steamer clearing for New York on June 28, took 504 piculs.—*Gilfillan, Wood & Co.*

SINGAPORE, September 4, 1888.—*Tin.*—August shipments from the Straits Settlements to the United States amounted to 300 tons, against 750 in 1887; to England, 1800, against 1300; since January 1 they were respectively 1450, against 35,550 and 12,400, against 8800—*Gilfillan, Wood & Co., to Charles Nordhaus, New York, per cable direct.*

PENANG, July 20, 1888.—Receipts.—*Tin* during the fortnight reached about 10,000 piculs, of which Europeans took 3600, while Chinese bought altogether 9000. The market opened at $33.50, receded to $31.55, and after touching $33.70 closed at $33.60. Chinese have purchased at $33.10 to ship to Singapore August 1. Shipments hence to England since January 1 amount to 79,568 piculs; to the United States, 1854. *Gum Benjamin* has brought $54 @ $69 for good merchantable, *Gutta-Percha* $60 @ $100, and *India Rubber* $70 @ $75. *Exchange.*—Four months' sight Bank on London, 3/1⅝ @ 3/1¾.—*Schmidt, Kustermann & Co.*

MANILA, September 4, 1888.—*Hemp*—Has been quiet at $10 ℔ picul, against $9.25 same date last year, equalling ℔ ton, cost and freight, £33. 4/, against £33. 17/. The clearances for the United States since last cable amounted to 7000 piculs, against 3000 last year, and since January 1 to 109,000, against 150,000. There are loading at present for the same destination 49,000 bales, against 29,000, while there have been cleared for England since January 1 243,000 bales, against 147,000 in 1887; loading for ditto, none, against 5000; cleared for all other ports, 51,000, against 28,000. Receipts at all ports since last cable, 14,000, against 17,000; since January 1, 399,000, against 334,000 in 1887 and 272,000 in 1886. *Freight*, $6, against $6. *Exchange*, 3/5 @ 3/9.—*Ker & Co. to Charles Nordhaus, New York, per cable direct.*

COLOMBO, July 19, 1888.—*Plumbago*—Is firm at the following quotations, in rupees ℔ ton: Large lumps, 145 @ 170; Ordinary ditto, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Following have been the shipments since October 1: To England 61,676 cwt.; to Marseilles, 38; to Trieste, 523; to Hamburg, 7415; to Antwerp, 3359; to Bremen, 1012; to India, 82; and to the United States 130,332—together, 204,437 cwt., against last year, 183,339, 145,341 in 1886, and 159,246 in 1885. *Coir Yarn*, Nos. 1 to 4, may be quoted 7 @ 12 rupees ℔ cwt. *Exchange*, six months' sight, 1/4⅝ @ 1/4 7-16.—*Volkart Bros. through their Agent, John W. Greene, 82 Wall street, New York.*

SPAIN.

BILBAO, August 25, 1888.—*Iron Ore.*—The first week following upon our report of the 11th inst. was still a dull one, whereas last week has been lively at 7/6 @ 8/ for Campanil and 6/10 @ 7/3 for Rubios. Still the demand for shipment abroad has fallen off considerably this year thus far, in part because it appears to be less needed, and partially because the owners of some of our mines have screwed their pretensions too high all along. Total shipments since January 1 sum up 2,494,122 tons, against 2,980,677 last year. *Pig Iron.*—During the first week of the fortnight under review little transpired, shipments abroad being restricted to 320 tons, and coastwise to 1136, but last week more was done for export, especially to Italy per steamer Cranwood, some 3111 tons being shipped, and 575 leaving our harbor coastwise. —*Bilbao Maritimo y Comercial.*

GERMANY.

HAMBURG, September 1, 1888.—*Iron.*—Pig Iron has been dull during the week in Rhenish-Westphalia. Stocks have increased somewhat in consequence of importations from England. Production in Germany and Luxembourg in July has been 354,111 tons as compared with 326,075 tons last year, and since January 1 it has been to the close of July, 2,460,825 tons, against 2,174,556 last year. The July production was made up of 177,320 tons Forge and Spiegel; 34,095 Bessemer; 100,216 Thomas and 42,480 Foundry. There has been a resumption of English purchases of Spiegel; the orders extend all the way to the close of the year. The quotation at Siegen remains 54 marks ℔ ton for 10 to 12 % Manganese. Both Forge Pig and Bessemer have been neglected, the former at 46 @ 47 at Siegen, but Thomas has been more active. Foundry Pig Iron has been in good request and firm, the demand from foundries being large. English Bessemer has been obtainable on the West Coast at 44/, an advance of 6d; Merchant is selling to a satisfactory extent at home, and the export demand also slowly revives. Structural Iron has continued lively; the demand for Beams exceeds the productive capacity. Hoop iron is less wanted. Competition among makers is on the increase, and the price now 136 to 137.50 Boiler Plates sell with as much ease as heretofore, thin Sheets less so; Siegen quotes the latter 146 to 150. Prices in the Wire branch remains firmly sustained. Machine shops are doing well, especially for the Navy. The increase of waterworks in Germany causes an enormous demand for Cast-Iron Pipe. Advices from Upper Silesia continue encouraging; even in the Wire branch it is believed that a giving way in prices will be avoided. The 27 Coke blast furnaces in blast were all doing well. *Metals* are unaltered and quite firm in this market.—*Borsenhalle.*

RUSSIA.

ST. PETERSBURG, August 30, 1888.—*Petroleum.*—The annual statement of accounts and balance sheet for the year 1887 of the Nobel Brothers Naphtha Production Company has just been submitted to the shareholders. The dividend declared for last year is 6 %. The assets are composed as follows: Real estate, 12,054,510 rubles; steamships, 5,307,086 rubles; rolling stock, 2,824,090; material for manufacturing purposes, 1,355,686 in this city and 515,276 in the various entrepots. Naphtha on hand, 2,793,282; cash, 94,126; deposits in bank, 261,636; outstandings, 2,495,441. The amounts of money held in reserve are 7,752,616 rubles. The company owe 3,468,859 rubles bonds outstanding and 22,000 shares of, together, 15,000,000 rubles.—*Journal de St. Petersbourg.*

The New Navy.—The Navy Appropriation bill has received the signature of the President and has become a law. It adds four cruisers and three gunboats to the new fleet, making an aggregate of 30 vessels of various classes. We have now the four Roach cruisers, Chicago, Atlanta, Boston and Dolphin, classed as 15-knot and 16-knot vessels. We have also under completion the five monitors, which will be slow, but will carry ten-inch guns, and can be used for harbor defense. We have in course of construction three gunboats of 16 knots, the Yorktown, Bennington and Concord, and one of 13, the Petrel, besides the three of 2000 tons authorized in the current act, from which 18 knots are expected. Of the cruisers, the Charleston, already launched, and the Newark are to make 18 knots, while the Baltimore, the Philadelphia and the San Francisco and the two 3000-ton vessels of the present act are to make 19 knots. The 5600-ton cruiser in this act is to be guaranteed to make 20 knots, which is the speed of the Vesuvius, the dynamite vessel. The Herreshoff torpedo boat will go at least 22 knots. More important than any of these are the three armored cruisers, of which the Maine and Texas are building, while a third, larger than either, is now authorized. The plans for an armored coast-defense vessel are being perfected. Here are 30 vessels to form the basis of an efficient navy, and the purchase of the swift little Stilleto has made the number 31.

A destructive fire in San Francisco, on Sunday, 9th inst., caused general havoc among the iron works and involved factories, mills and other manufacturing property to the extent of $1,000,000. The loss of the National Iron Works is estimated at $130,000; of the Novelty Iron Works, $22,000 and the Columbia Foundry, $25,000. Few particulars have been received.

Ordnance for the Army.

The conference reports on the Fortifications and Army Appropriation bills were adopted in both houses on Monday. The report on the Army bill drops all the Senate amendments for the manufacture of ordnance. The Fortifications bill, as agreed to, embodies Mr. Sayers's proposition appropriating $1,500,000 for steel forgings, which was originally a subject of strong opposition. The Army bill, as finally agreed upon, carries an appropriation of $24,471,300. The Fortification bill appropriates $3,972,000. These bills had provisions for the same purpose which were inserted by the Senate, with a view to securing the appropriation in one of them if the House should disallow it in the other. The chief item so duplicated was that known as the Hawley amendment, which appropriated more than $6,000,000 for ordnance. The substance of this amendment remains as a part of the Fortification bill, though its aggregate is reduced about one-half. Aside from the regular provisions of the Army and Fortifications bills, these measures appropriate as follows: For the manufacture of cannon and carriages, $200,000; for testing pneumatic guns, shells, &c., $100,000; for gun factory at Watervliet Arsenal, $700,000, for the purchase of rough-bored steel, $1,500,000; for submarine mines and submarine controllable torpedoes, $200,000; for rifled mortars, $250,000; for the purchase of tests of ordnance by the Ordnance Board, $500,000. All but the two first named items were included in the Hawley amendment, and were especially championed in the House by Mr. Sayers, of Texas.

The Harvey Steel Company, of Jersey City, announce that they are now erecting large works at Newark, N. J., fully equipped with rolls, hammers, &c., for the manufacture of steel. The works are to be ready for general orders on all high grades of steel, January 1, 1889. During the interval they are utilizing their present works and process for the treatment of all kinds of drop dies and forgings used in pressure work, &c., and made from Bessemer steel.

W. G. Price & Co., of Pittsburgh, proprietors of the Berlin Iron and Lead Works, some time ago decided to remove their works from that city on account of excessive taxes and the high rates charged for natural gas. The firm looked at several sites at McKeesport, which is about 15 miles from Pittsburgh, but finally decided to locate at Greensburg, which is situated on the Pennsylvania Railroad, 31 miles from Pittsburgh. The citizens of that place offered the firm a free site for their works and other inducements, which have been accepted. The work of removal will begin at an early date.

Charles Frederick Herreshoff, of Bristol, R. I., died of pulmonary disease, at his home in that city, on Saturday evening, in the 80th year of his age. Mr. Herreshoff was the father of the famous Herreshoffs, the boat builders. Many of the fastest boats built by the Herreshoffs were modeled by the father.

The Chicago, Burlington and Quincy Railroad, one of the dozen largest lines in the country, has lost $5,318,715 in net earnings for the first seven months of the current year. Strikes and a rate war have done this in equal shares.

The Lewis Lawn Mower.

The Seneca Falls Lawn Mower Company, Seneca Falls, N. Y., of which J. N. Hammond and W. P. Elwell are proprietors, are putting on the market a new lawn

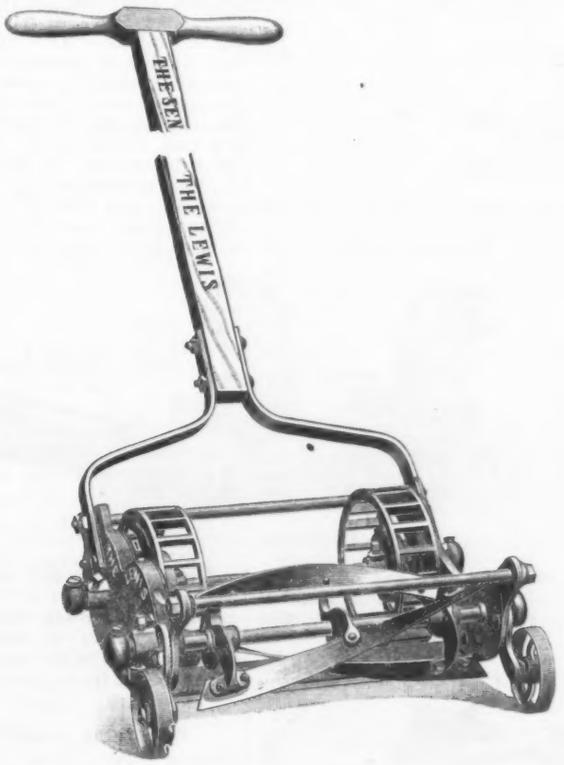


Fig. 1.—The Lewis Lawn Mower.

mower which is named the Lewis, a general view of which is given in Fig. 1, a special feature of its construction being shown in Fig. 2. This is a front-cut machine, with its driving wheels worked independently of each other, in order that it may do its work up to and around obstructions. The driving wheels are in the rear of the fly, in order to avoid running over and crushing uncut grass. The axles have conical bearings and the oil

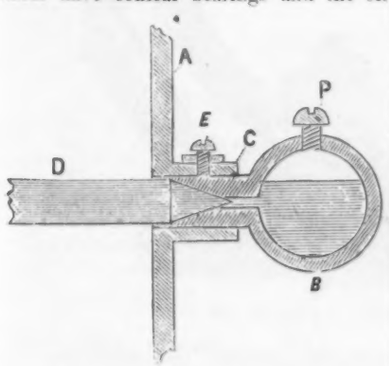


Fig. 2.—Self-Lubricating Device.

reservoirs are provided with stems with flaring mouths, in which fit the conical bearings of the axles. An important feature in the construction of the machine, and one which the manufacturers emphasize as embodying special advantages, is the fact that it is self-lubricating, the axles both of the driving wheels and of the cutting cylinder or fly running on centers in adjustable boxes that have a self-feeding oil chamber. The details of this part of the machine are shown in Fig. 2, which gives a longitudinal section through the axle and oil reservoir. This construction will be readily understood: A is the side plate of the machine; B is the oil reservoir with stem; C is the collar on side plate that holds oil reservoir; D is the axle with conical ends on which the wheels run; E is the screw that holds oil reservoir in place; F is the screw to be taken out to fill reservoir with oil. The company allude to the manifest advantage of this self-lubricating arrangement as obviating the necessity of carrying oil cans on the lawn, and also the fact that it is not necessary in the use of the machine to stop work for the purpose of oiling it. They also emphasize the point that these self-oiling boxes are adjustable, so that the wear can be taken up. It is also to be observed that the driving wheels are open tractions, light and strong, and the point is made that they do not cut the lawn, and that they take a firm hold of the ground, doing away with any slipping or lost power and imparting a continuous motion to the knives, while the wheels working independently of each other, the fly keeps in motion and performs its work when the machine is run around curves. The further points made in regard to this machine are: That it cuts smoothly, runs easily, is light, strong and compact, is thoroughly built of the best materials and all the parts are made interchangeable.

The Lawrence Solid Back Perfect Comb.

The Lawrence Curry Comb Company, 204 and 206 East Forty-third street, New York, have recently put on the market a new curry comb, which is represented in the accompanying illustration. It is designated as a solid back Perfect curry comb. Special attention is called to the fact that it is made of steel, and is the only steel Perfect comb on the market. It is made six or eight bars of heavy steel, with steel wires, tinned rivets and knocker and enameled handles. It is made also in iron. These combs are referred to as very strong and durable and of attractive and convenient pattern, while the prices at which they are offered deserve the attention of the trade.

Chamberlain, Wheeler & Co., Columbus, Ohio, announce that Mr. Cartwright has removed to St. Louis to represent their interest in the office recently opened in that city. Mr. Wm. C. Hayward will succeed Mr. Cartwright at their office at No. 58 Dearborn street, Chicago. Their brands are Gore, Norway, Crown, Akron, Bessie, Winona, Sheffield, Jefferson (Cold blast) and Pencost Ferro-Silicon.

The first sheet of plate glass manufactured in this country is still doing duty in the show-window of a store in New Albany, Ind. The glass was made by Capt. J. B. Ford, at the plate glass works of that city, when he was operating them. He was called the pioneer of plate glass manufacturing in America.

The Lawrence Solid Back Perfect Comb.

Humphrey's Cavity Plane.

The Humphrey Tool Company, of Warren, Mass., are directing the attention of woodworkers to a very neat and convenient plane, which they are offering in three sizes of each style shown in the accompanying engravings. Fig. 3 presents a general view of the plane, showing the handles with and without tips. The center piece of the tool, holding the knife or cutting blade, is of metal, while the handles are of wood. The knife, which is of fine tool steel, is firmly held in position by screwing up one or both of the handles, or it may be done by removing the tips from the ends of the handles and inserting them in place of the handles, thus securing a very short tool. There are no set-screws or other projections, and the whole tool is constructed with a view to using in close places. As will be seen by reference to Fig. 3 of the engravings, the handles are slightly offset to enable the operator to employ the tool in surface-work. In Fig. 1 is shown the plane with the handle at the left removed, making it a right-hand tool. In order to adjust it for use in this shape it is only necessary to remove one handle and screw up the other. For a left-hand tool the reverse operation is necessary. In order to make such a tool as is indicated in Fig. 2 of the cuts, take off one of the handles, and, using it as a screw-driver, remove the tip from the opposite handle and insert it in the place occupied by the handle removed. Then take off by the same process the other tip and insert it at the opposite end. Set the blade well back and tap it down to the required cut, after the handles are well screwed up. The manufacturers claim for this tool that it permits of working on short curves and plain surfaces; that the various adjustments are easily and quickly made; that it cuts clear and in every way satisfactorily.

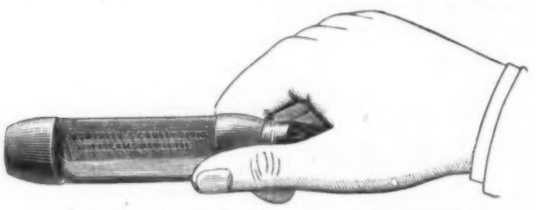


Fig. 1.—Tool Arranged for Use with One Hand.

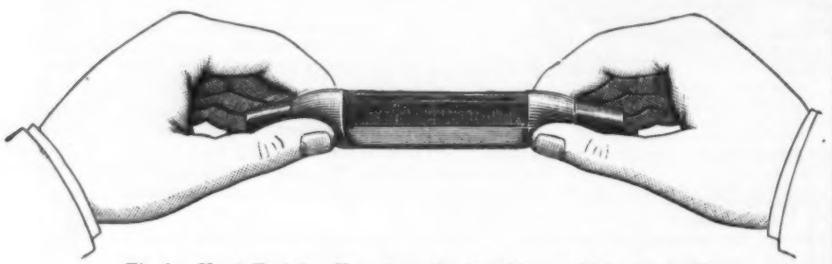


Fig. 2.—Short Tool for Use where the Handles would be in the Way.

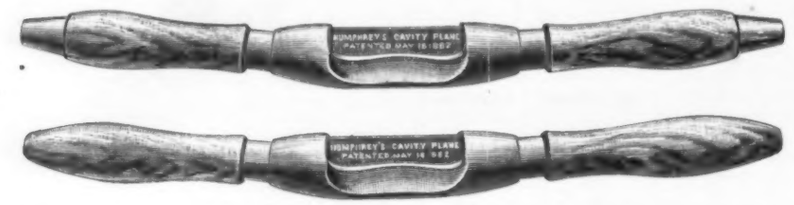


Fig. 3.—Humphrey's Cavity Plane.—Two Styles—with and without Tips to the Handles.

A locomotive with the Strong valve gear and boiler is now nearly completed, and will shortly make some experimental runs upon the New York and New England. The engine was built for the Atchison, Topeka and Santa Fé, and Mr. Strong appears satisfied that a speed of 70 miles per hour can be attained between Chicago and Kansas City when the engine in question is employed to haul the trains. As regards the Strong locomotive No. 444 on the Lehigh Valley Road, to which we have had occasion to refer several times in these columns, it may not be without interest to note that owing to the defective manner in which the seam between the combustion chamber and fu rnaces was made, the engine was withdrawn from active service after running some six months. The Adamson seam was subsequently adopted, and the engine is now at work on the Lehigh Valley hauling heavy passenger trains.

The Champion Tire Shrinker.

The cuts herewith given represent this article, which is manufactured by the Champion Blower and Forge Company, Lancaster, Pa. Fig. 1 represents the shrinker ready for use, while Fig. 2 indicates the method of its operation, showing it in use. The company explain that all that is necessary to operate the shrinker is simply to place the tire under the clamps, when by the least stroke of the hammer they drop over their center and lock firmly on the tire, when with but little pressure on the handle the tire can be shrunk as desired. The simplicity, durability and efficiency of this shrinker are mentioned, and it is claimed that it is managed by one man with perfect ease and works equally well on light steel tire and on wagon tire 4 x 1 inch. When the machine is not being used the handle can be taken out of the socket. The floor space occupied by the tire shrinker is 18 x 10 inches and its weight is 130 pounds.

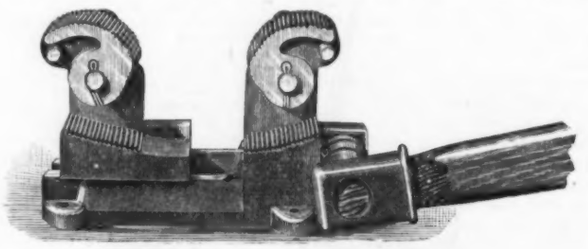


Fig. 1.—Champion Tire Shrinker.

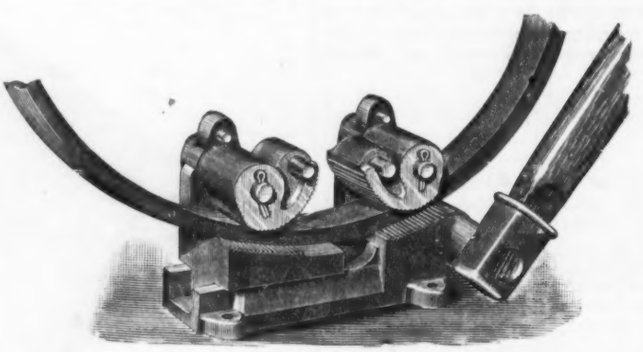
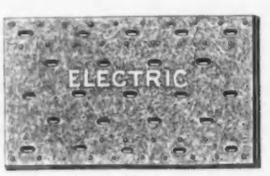


Fig. 2.—Champion Tire Shrinker in Use.

Perforated Leather Belting.

We illustrate, in the annexed engraving, a novel method of preventing "air cushions" in belts run at a high rate of speed. The perforations are made in a regular and uniform manner and at equal distances apart over the entire surface of the belt, thus insuring, it is claimed, equal tension and leaving the tensile strength of the belt uninjured. Besides preventing "air cushions," these belts are said to run smoother, steadier and make less noise than ordinary belts. They are adapted to high-speed dynamos, especially those of alternating current system. Chas. A. Schieren & Co., of New York, have just completed the machinery necessary for the manufacture of the belting.



Perforated Leather Belting.

CURRENT HARDWARE PRICES.

SEPTEMBER 12, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.

Caps, Percussion, ₩ 1000—
Hicks & Goldmark's
F. L. Waterproof, 1-10's ....50¢
E. B. Trimmed Edge, 1-10's.....65¢ } dis 25@ 25&
E. B. Ground Edge, Central Fire, 1-10's. 70¢ } 7½ %
Double Waterproof. 1-10's.....$1.40 }
Musket Waterproof, 1-10's. ....50¢
G. D.....28¢
S. B.....30¢
Union Metallic Cartridge Co.
F. C. Trimmed.... .....50¢
F. L. Ground.... .....65¢ } dis 25@
Cen. Fire Groun 70¢ } 25&
Double Water proof. .....$1.40 } 7½ %
Double Wa proof. in 1-10's.....$1.40 }
S. B. Genuine Imported..... .....45¢
Eley's E. B. .....54¢ @ 55¢
Eley s D Waterproof, Central Fire.....$1.60

Cartridges—
Rim Fire Cartridges..... .dis 50&5&2 %
Rim Fire Military ....dis 15&2 %
Central Fire, Pistol and Rifle.....dis 25&5&2 %
Central Fire, Military & Sporting ...dis 15&5&2 %
Blank Cartridges, except .22 and .32 cal., an additional 10 % over above discounts.
Blank Cartridges .22 cal .....$1.75, dis 2 %
Blank Cartridges, .32 cal.....$3.50, dis 2 %
Primed Shells and Bullets..... .....dis 15&5&2 %
B. B. Caps, Round Ball. ....$1.75, dis 2 %
B. B. Caps, Conical Ball, Swaged.....$2.00, dis 2 %

Primers—
Berdan Primers all sizes, and B. L. Caps (for Sturtevant Shells) .....$1.00, dis 2 %
All other Primers, all sizes.....$1.20 dis 2 %

Shells—
First quality, 4, 8, 10 and 12 gauge. dis 25&10&2 %
First quality, 14, 16 and 20 gauge ($10 list)..... dis 30&10&2 %
Star, Club, Rival and } 10 gauge, $9 list } ..dis 33⅓
Climax Brands. } 12 gauge, $8 list } &10 2 %
Club, Rival and Climax Brands, 14, 16 and 20 gauge.....dis 30&10&2 %
Selbold's Combination Shot Shells.....dis 15&2 %
Brass shot Shells, 1st quality.....dis 50&2 %
Brass Shot Shells Club, Rival, Climax. dis 65&2 %
A. B. & C Co., I. X. L., 10 & 12 gauge...d s 40&5&2 %
A. B & C. Co., "Special," 16 gauge..dis 30&10 &5&2 %
A. B. & C. Co. "Special," 10 & 12 gauge...40&10&2 %
Fowler's Patent, 10 & 12 gauge. ₩ 100.....$3.75

Shells Loaded—
List No. 19, 1887.....dis 20 & 10 %

Wads—
U. M. C. & W. R. A.—B. E., 11 up...$2.00 }
U. M. C. & W. R. A.—B. E., 9&10 .. 2.30 }
U. M. C. & W. R. A.—B. E., 7&8.. 2.60 } D s 20&2 %
U. M. C. & W. R. A.—P. E., 11 up. 3.10 } With small
U. M. C. & W. R. A—P. E., 9&10.. 4.00 } extras.
U. M. C. & W. R. A.—P. E., 7&8 ... 490 }
Eley's B. E., 11 up.....$1.75
Eley's P. E . 11 @ 20 .....$2.80

Anvils.—Eagle Anvils.....₩ ₤ 10¢, dis 20 @ 20&5 %
Peter Wright's. ....9½¢
Armitage's Mouse Hole.....9½¢
Armitage Mouse Hole, Extra. .....11½@11½¢
Trenton.....9½¢@9½¢
Wilkinson's.....9½¢@10¢
J. & Riley Carr. Patent Solid.....11@11½¢

Anvil Vise and Drill—
Millers Falls Co.....$18.00, dis 20 %
Cheney Anvil and Vise.....dis 25 %
Allen Combined Anvil and Vise.....$3, dis 40&10 %
Moore & Barnes Mfg. Co.....dis 33⅓ %

Augers and Bits.

Douglass Mfg. Co.....
New Haven Copper Co.....
Wm. A. Ives & Co.....
Humphreysville Mfg. Co.....
French, Swift & Co. (F. H. Beecher)
.....dis 70 %

Cook's, Douglass Mfg. Co.....dis 55 %
Cook's, New Haven Copper Co...dis 50&10&50&10&5 %
Ives' Circular Lip.....dis 60 %
Patent Solid Head.....dis 30 %
C. E. Jennings & Co., No. 10, extension Lip.....dis 40 %
C. E. Jennings & Co., No. 30.....dis 60 %
C. E. Jennings & Co., Auger Bits, in fancy boxes, ₩ set, 32½ quarters, No 5, $5; No. 3C, $2.....dis 20 %
Lewis' Patent Single Twist.....dis 45 %
Russell Jennings' Augers and Bits.....dis 25 %
Imitation Jennings' Bits (new list).....dis 60@6.&5 %
Pugh's Black.....dis 20 %
Car Bits.....dis 50&10&60 %
L'Hommedieu Car Bits.....dis 15&10 %
Forstner Pat. Auger Bits.....dis 10 %

Solow Augers—
Ives .....
French, Swift & Co. } dis 25&10 @ 25&10&5 %
Douglass' .....
Bonney's Adjustable ₩ dos. $45.....dis 40&10 %
Stearns'.....dis 20&10 %
Ives' Expansive, each $4.50.....dis 50&10 %
Universal Expansive, each $4.50 .....dis 20 %
Wood's.....dis 25 @ 25&10 %

Expansive Bits—
Clark's small, $18; large, $36.....dis 35 @ 35&5 %
Ives' No. 4, per doz., $60.....dis 35 @ 40 %
Swan's .....dis 40 %
Steer's, No. 1, $26; No. 2, $22.....dis 35 %
Stearns' No. 2, $48.....dis 20 %

Gimlet Bits—
Common.....₩ gross $2.75 @ $3.25
Diamond.....₩ dos. $1.10, dis 25&10 %
"Bee".....dis 35 @ 25&5 %
Double Cut, Sheardson's.....dis 45 @ 45&5 %
Double Cut, Ct. Valley Mfg. Co.....dis 30&10 %
Double Cut, Hartwell's, ₩ gro. $5.25
Double Cut. Douglass'.....dis 40&10 %
Double Cut. Ives'.....dis 60 @ 60&5 %

Bit Stock Drills—
Morse Twist Drills.....dis 50&10&5 %
Standard.....dis 50&10&5 %
Cleveland.....dis 50&10&5 %
Syracuse, for metal.....dis 50&10&5 %
Syracuse, for wood (wood list .....dis 30 @ 30&5 %
Williams' or Holt's, for metal. .....dis 50&10&10 %
Williams' or Holt's, for wood.....dis 40&10 %

Ship Augers and Bits—
L'Hommedieu's.....dis 15&10 % } Extras
Watrous's.....dis 15&10 % } often
Snell's.....dis 15&10 % } given.
Snell's Ship Auger Patt'n Car Bits. dis 15&10 %

Awl Hafts.
Sewing, Brass Ferrule.....$3.50 ₩ gross—dis 45&10 %
Patent Sewing, Short.....$1.00 ₩ doz—dis 40&10 %
Patent Sewing, Long.....$1.20 ₩ dos.—net
Patent Peg, Plain Top.....$10.00 ₩ gross—dis 45&10 %
Patent Peg, Leather Top....$12.00 ₩ gross—dis 45&10 %

Awls, Brad Sets, &c.
Awls, Sewing, Common.....₩ gross $1.70—dis 35 %
Awls, Shouldered Peg...₩ gross $2.45—dis 40@40&10 %
Awls, Patent Peg.....₩ gross 63¢—dis 40@40&10 %
Awls, Shouldered Brad.....$2.70 ₩ gross—dis 35 %
Awls, Handled Brad.....$7.50 ₩ gross—dis 45 %
Awls, Handled Scratch.....$7.50 ₩ gross—dis 35&10 %
Awls, Socket Scratch.....$1.50 ₩ doz—dis 25 @ 30 %

Awl and Tool Sets.
Aiken's Sets, Awls & Tools, No. 20, ₩ doz. $10—dis 55&10 %
Gray's Ad Tool Hdls., Nos. 1, $12; 2, $18.; 3, $12; 4, $9. dis 25@25&10 %
Miller's Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18. dis 25 %
Penry's Combination Haft.....₩ doz. $6
Brad Sets, No. 42, $10.50, No. 43, $12.50...dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50. }
Brad Sets, Stanley's Excelsior, No. 2, $4.00. } dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 3, $5.50. }

Axes.
Makers' and Special Brands—
First quality.....₩ dos. $6.00 @ $6.50
Others.....₩ dos. $5.50 @ $5.75

Axle Grease.
Fraser's, in bulk.....Keg ₩ ₤, 4¢; Pail, ₩ ₤, 5¢ net
Frasers, in boxes.....₩ gross $9.50
Dixon's Everlasting, in bxs., ₩ dos., 1 ₤: $1.20; 2 ₤, $2
Dixon's Everlasting.....10-₤ pails, each, 85¢
Lower grades, special brands.....₩ gro $5.50 @ $7

Axles.—No. 1, 4¢ @ 4¼¢; No. 2, 5¼ @ 5½¢.
Nos. 7 to 18.....dis 50@55 %
Nos. 19 to 22.....dis 60&10&10@70 %
National Wrought Steel Tubular Self-Oiling:
Standard Farm (1 to 5) and Special Farm (A1 to A5)
Less than 10 sets.....dis 33⅓ %
Over 10 sets.....dis 33⅓&5 %
Strong Exp. (6 to 9), & XX Strong Truck (10 to 16):
Less than 10 sets.....dis 10 %
Over 10 sets.....dis 10&5 %

Bag Holders.
Sprengle's Pat., ₩ dos $18. .....dis 60 %

Balances.—Spring Balances.....dis 50 %
Common 24 ₤.....₩ dos., $1.50—dis 50 %
Chatillon's Spring Balances.....dis 50 %
Chatillon's Circular Spring Balances.....dis 60 %

Bells.
Hand—
Light Brass.....dis 70&10 %
Extra Heavy.....dis 66&10 %
White Metal.....dis 60&10&10 %
Silver Chime.....dis 33⅓&10 %
Globe (Cone's Patent).....dis 25&10 @ 35 %

Door—
Gong, Abbe's.....dis 33⅓&10 %
Gong, Yankee.....dis 45&10 %
Gong, Barton's.....dis 40&10 @ 50 %
Crank, Taylor's.....dis 25&10 %
Crank, Brooks'.....dis 50&10&2 %
Crank, Cone's.....dis 10 %
Crank Connel's.....dis 20&10 %
Lever, Sargent's.....dis 60&10 %
Lever, Taylor's Bronzed or Plated.....net
Lever, Taylor's Japanned.....dis 25&10 %
Lever, R. E. ₩ Co.'s.....dis 50&10&2 %
Pull, Brook's .....dis 50&10&2 %
Pull Western's.....dis 25&10 %

Cow—
Common Wrought.....dis 60&10 %
Western.....dis 20&10 %
Western, Sargent's list.....dis 70&10 %
Kentucky "Star".....dis 20&10 %
Kentucky, Sargent's list.....dis 70&10 %
Dodge, Genuine Kentucky, new list. dis 70@70&10 %
Texas Star.....dis 50&10 @ 50&10&5 %
Call.....dis 40@40&5 %
Farm Bells.....₩ ₤, 3¢ @ 3½¢
Steel Alloy Church and School Bells.....dis 40 %

Bellows.—Blacksmiths'.....dis 50&10&5 @ 60 %
Moulders'.....dis 40 @ 40&10 %
Hand Bellows.....dis 4 @ 10 @ 10 %

Belting, Rubber.
Common Standard.....dis 70&10 %
Standard.....dis 70&70&10 %
Extra.....dis 60&10 %
N. Y. R. & P. Co., Standard.....dis 60&5 %
N. Y. R. & P. Co., Extra Standard.....dis 50&10 %

Bench Stops.
Morrill's.....₩ dos $9—dis 50 %
Hotchkiss's .....₩ dos $5.00—dis 10 @ 10&10 %
Weston's, per doz No. 1, $10; No. 2, $9...dis 25&10&5 %
McGill's.....₩ doz $3—dis 10 %

Bits.—Auger, Gimlet Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders.
Extension, Barber's.....₩ dos $15.00—dis 40 @ 40&10 %
Extension, Ives'.....₩ dos $20.00—dis 60&5 @ 60&10 %
Diagonal.....₩ doz $24.00—dis 40 %
Angular.....₩ dos $24.00—dis 40&5 %

Blind Adjusters.
Domestic.....₩ per doz $3.00—dis 33⅓ %
Excelsior.....₩ dos $10.00—dis 50&10&2 %
Washburn's Self-Locking.. ..... dis 20 @ 20&10 %

Blind Fasteners.
Mackrell's.....₩ dos pairs, $1.00—dis 20@20&10 %
Van Sand's Screw Pattern.....$15 ₩ gro.—dis 60&10 %
Van Sand's Old Pattern.....$15 ₩ gro.—dis 55&10 %
Washburn's Old Pattern.....$9 ₩ gro. net
Merriman's.....new list, net
Austin & Eddy No. 2006.....$9 ₩ gro. net
Security Gravity.....$9 ₩ gro. net

Blind Staples.
Barbed, ⅞ in. and larger.....₩ ₤ 7¢ @ 8¢ net
Barbed, ¾ in.....₩ ₤ 8½ @ 9¢ net

Blocks.
Ordinary Tackle, list April 17, '85.....dis 40 %
Cleveland Block Co., Mal. Iron.....dis 50 %
Novelty Tackle Blocks, Mal. Iron.....dis 50 %

Bolts.
Door and Shutter—
Cast Iron Barrel, Square, &c.....dis 70 @ 70&10 %
Cast Iron Shutter Bolts.....dis 70 @ 70&10 %
Cast Iron Chain (Sargent's list).....dis 60&10 %
Ives' Patent Door Bolts.....dis 60 %
Wrought Barrel.....dis 70 @ 70&10 %
Wrought Square.....dis 70 @ 70&10 %
Wr't Shutter, all Iron, Stanley's list.....dis 60&10 %
Wr't Shutter, Brass Knob, Stanley's .....dis 40&10 %
Wrought Shutter, Sargent's list .....dis 60&10 %
Wrought Sunk Flush, Sargent's list.....dis 55&10 %
Wrought Sunk Flush, Stanley's list .....dis 50&10 %
Wrought B.E. Flush, Com'n Stanley's list. dis 55&10 %

Carriage—
Com. list June 10, '84.....dis 75&5&2 %
Genuine Eagle, list Oct., '84.....dis 75&10 %
Phila. pattern, list Oct. 7, 84...dis 75&10@75&10&5 %
R. B. & W. old list.....dis 70 %

Tire—
Common, list Feb. 28, 1883.....dis 70 %
P. C. B. & N. Co., Empire, list Feb. 28, 1883.....dis 70 %
P. C. B. & N. Co., Philadel., list Oct., 84.....dis 82½ %
P.C.B.&N.Co., Keystone, Phil. list. Oct '84.....dis 80 %
P.C.B.&N.Co., Norway, Phil. list. Oct.'84. dis 75&10 %
Am. S. Co., Norway, Phil., list Oct. 16, '84..dis 75&10 %
Am. S. Co., Eagle, Phil., list Oct. 16, '84.....dis 80 %
Am. S. Co., Philadel. list. Oct. 16, 84.....dis 82½ %
Am. S. Co., Bay State, list Feb. 28, '83.....dis 70 %
R. B. & W., Philadel. list Oct. 16, 1884.....dis 82 %
R. & E. Mfg. Co.....dis 70 %

Stove and Plow—
Stove.....dis 62½ %
Plow.....dis 60&5 %
Am. S. Co. Stove, Annealed.....dis 62½ %
R. B. & W., Plow.....dis 55 %
R. B. & W., Stove.....dis 62½ %
R. & E. Mfg Co., Stove.....dis 62½ %
Machine.....dis 75&10 @ 80 %
Bolt Ends.....dis 75&10 @ 80 %

Borax......₩ ₤ 9½@10½¢

Boring Machines.

Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75.....dis 50 %
Snell's, Rice's Patent.....	5.50	6.75.dis 40&10&10 %
Jennings.....	5.50	6.75..dis 45&45&10 %
Other Machines.....	2.35	2.75. .....net
Phillips' Pat., with Augers	7.00	7.50.....net

Bow Pins
Humason, Beckley & Co.'s.....dis 60&10 %
Sargent & Co.'s.....$17 and $18, dis 60&10 %
Peck, Stow & W. Co.....dis 50&10 @ 50&10&5 %

Braces.
Backus, Nos. 110 to 114 and 31 to 33..dis 60&5@60&10%
Backus, Nos. 5, 8, 12, 14 .....dis 60&10&5 %
Backus, Nos. 16, 18, 20, 29, 7 ₤, 11.....dis 70&10&5 %
Barber's, Nos. 10 to 16 .....dis 50 %
Barber's, Nos. 30 to 33.....dis 50&10 %
Barber's, Nos. 40 to 63.....dis 50&10 %
Barker's, Nos. 8, 10 and 12.....dis 75&10@80 %
Barker's, Plated, Nos. 8, 10 and 12.....dis 65&10@70 %
Osgood's Ratchet.....dis 40&10&50 %
Spofford's.....dis 50&10 %
Ives' New Haven Novelty.....dis 70 @ 70&5 %
Ives' New Haven Ratchet.....dis 5.&5 @ 60&10 %
Ives' Barber Ratchet.....dis 60&5 @ 60&10 %
Ives' Barbers.....dis 60&5 @ 60&10 %
Ives' Spofford .....dis 60&5 @ 60&10 %
Common Ball, American.....$1.10 @ $1.15
Bartholomew's, Nos. 25, 27, 30.....dis 50&10@60&5 %
Bartholomew's, Nos. 117 118 119.....dis 70 @ 70&5 %
Amidon's Barker's Imp'd Pla'n .....dis 75&10 @ 80 %
Amidon's Barker's Imp. Nickeled.....dis 65&10 @ 70 %
Amidon's Ratchet .....dis 75&10 @ 80 %
Amidon's Eclipse Ratchet.....dis 60 %
Amidon's Globe Jawed.....dis 40&40&10 %
Amidon's Corner Brace.....dis 40 @ 40&10 %
Amidon's Universal.....8 in., $2.10; 10 in., $2.25
Amidon's Buffalo Ball.....$1.10 @ $1.15
P. S. & W.....dis 50&10 %

Brackets.
Shelf, plain, Sargent's list.....dis 55&10 @ 55&10&10 %
Shelf, fancy, Sargent's list.....dis 60&10 @ 60&10&10 %
Reading, plain.....dis 60&10 @ 60&10&5 %
Reading, Rosette.....dis 60&10 @ 60&10&10 %

Bright Wire Goods......dis 85 @ 85&10

Broilers. { Inch..... 9 10 9 x 11
Heuls' Self-Basting.. } Per doz..... $4.50 5.50 6.50

Buckets.—See Well Buckets and Pails.

Bull Rings.—Union Co. Nut.....dis 55 %
Sargent's.....dis 66⅔&10 @ 70&5 %
Hotchkiss' low list.....dis 30 %
Humason, Beckley & Co.'s.....dis 70 %
Peck, Stow & W. Co.'s.....dis 50&10 @ 50&10&10 %
Ellrich Hdw. Co., White Metal, low list. dis 50@50&10 %

Butcher's Cleavers.
Bradley's.....dis 25 @ 30
L. & I. J. White.....dis 20&5 %
Beatty's.....dis 40 @ 40&5%

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s.....dis 40
P. S. & W .....dis 33⅓&5@33⅓&10

Butts.
Brass—
Wrought Brass.....dis 70@70&10 %
Cast Brass, Tiebout's.....dis 33⅓ %
Cast Brass, Corbin's Fast.....dis 33⅓&10 %
Cast Brass, Loose Joint.....dis 33⅓&10 %

Cast Iron—
Fast Joint, Narrow..... dis 50&10
Fast Joint, Broad.....dis 55&10
Loose Joint. }
Loose Joint, Japanned. }
Loose Joint, Jap. with Acorns. }
Parliament Butts. } ....dis 70&10
Mayer's Hinges. }
Loose Pin, Acorns. }
Loose Pin, Acorns, Japanned. }
Loose Pin, Acorns, Jap, Pltd. Tips. }

Wrought Steel—
Fast Joint Narrow .....dis 70&10 %
Fast Joint, Lt. Narrow.....dis 70&10 %
Fast Joint, Broad.....dis 70&10 %
Loose Joint, Broad.....dis 70&10 %
Table Butts, Back Flaps, &c.....dis 70&10 %
Inside Blind, Regular.....dis 70&10 %
Inside Blind, Light.....dis 70&10 %
Loose Pin.....dis 70&10 %
Bronzed Wrought Butts.....dis 40&10@40&10&5 %

Calipers.—See Compasses.

Calks, Toe
Gautier.....₩ ₤ 5½@6¢
Dewicks.....₩ ₤ 5½@6¢

Can Openers.
Messenger's Comet.....₩ dos $3.00, dis 25 %
American.....₩ gross $3.00
Duplex.....₩ doz 25¢, dis 15 @ 20 %
Lyman's.....₩ dos $3.75, dis 20 %
No. 4, French.....₩ dos $2.25, dis 55 @ 60 %
No. 5, Iron handle.....₩ gross $6.00, dis 45 @ 50 %
Eureka.....₩ dos $2.50, dis 10 %
Sardine Scissors.....₩ dos $2.75@$3.00 %
Star.....₩ dos $2.75 %
Sprague, No. 1, ₩ ?, $1.25; ₩ ?, $2.50.....dis 50&10&10 %

Small extras given by some dealers.

World's Best, ₩ gross, No. 1, $12.00; No. 2, $24.00, No. 3, $36.00.....dis 50&10 %
Universal.....₩ doz $3.00, dis 35&5 %
Domestic.....₩ doz $2.50, dis 45 %
Champion.....₩ doz $2.00, dis 50 %

Cards.
Horse and Curry.....dis 10&10 @ 10&10&10 %
Cotton.....New list, Aug., 1883, dis 10 @ 10&10 %
Wool.....dis 10 @ 10&10 %

Carpet Stretchers.
Cast Steel, Polished.....₩ doz 12.25
Cast Iron, Steel Points.....₩ doz 80¢
Socket.....₩ doz $1.75
Bullard's.....dis 25 @ 25&10 %

Carpet Sweepers.
Bissell No. 5.....₩ doz $17.00
Bissell No. 7 New Drop Pan.....₩ doz $19.00
Bissell Grand.....₩ doz $36 00
Grand Rapids.....₩ doz $24.00
Crown Jewel.....No. 1, $15; No. 2, $19; No. 3, $20
Magic.....₩ doz $15.00
Jewel.....₩ doz $17.00
Improved Parlor Queen, Nickeled Trimmings.....₩ doz $27.00
Improved Parlor Queen, Japanned Trimmings.....₩ doz $24.00
Excelsior.....₩ doz $22.00
Garland.....₩ doz $18.00
Parlor Queen.....₩ doz $24.00
Housewife's Delight.....₩ doz $15.00
Queen.....₩ doz $16.00
Queen, with band.....₩ doz $18.00
King.....₩ doz $30.00
Weed Improved.....₩ doz $18.00
Hub.....₩ doz $16.00
Cog Wheel.....₩ doz $16.00

Cartridges.—See Ammunition.

Casters.
Bed, Plate, Shallow Socket, Deep Socket.....{ New list: Brass ..dis 55 @ 55&5 %; Others..dis 60 @ 60&5 %
Yale Casters, list May, 1884.....dis 30&10&40 %
Yale, Gem.....dis 60@60&5 %
Martin's Patent (Phœnix).....dis 45&10 @ 50 %
Parson's Anti-friction.....dis 60 @ 60&10 %
"Giant" Truck Casters.....dis 10 @ 10&5 %
Stationary Truck Casters.....dis 45&10

Cattle Leaders.
Humason, Beckley & Co.'s.....dis 70 %
Sargent's.....dis 66⅔&10 %
Hotchkiss.....dis 30 %
Peck Stow & W. Co.....dis 50&10 %

Chain.
Trace, 6/4-10-2, exact sizes, ₩ pair, $1 03; Trace, 6/4-10-3, exact sizes, ₩ pair, .92; Trace 7-10-2, exact sizes.. ₩ pair, 1.11 } dis 50&10&5 @ 60%
NOTE.—Traces, "Regular" sizes 3/4 net ₩ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884.....dis 50&10 @ 50&10&5 %
American Coil 3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
In cask lots. 8.75 6.25 5.00 4.50 4.40 4.00 3.75 3.50
Less than cask lots, add ¼¢@½¢ ₩ ℔.
German Coil, list of June 20, 1887....dis 50&10&5@60 %
Ger. Halter Chain, list of June 20, 1887.....dis 50&10&5@60 %
Covert Halter, Hitching and Breast.....dis 50&2 %
Covert Traces.....dis 35&2 %
Oneida Halter Chain.....dis 60 @ 60&5 %
Galvanized Pump Chain.....₩ ℔ 5½¢ @ 6¢
Jack Chain, Iron.....dis 70&10 @ 75 %
Jack Chain, Brass.....dis 65 @ 70 %

Chalk.—White.....₩ gro 50¢
Red.....₩ gro 70¢
Blue.....₩ gro 87½¢
White Crayons.....₩ gro 12¢ @ 12½ dis 10¢

Chalk Lines.—See Lines.

Chisels.
Socket Framing and Firmer—
P., S. & W., New Haven and Middlesex, Mix.....{ dis 75&5 @ 75&10 %
Buck Bros.....dis 30 %
Merrill.....dis 60&10@60&10&5 %
L. & I. J. White.....dis 30 @ 30&5 %
Witherby and Douglass.....dis 75 @ 75&5 %
Tanged Firmers.....dis 40&10 %
Tanged Firmers, Butcher's.....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's.....$5.00 to $
Tanged Firmers, Buck Bros.....dis 30 %
Cold Chisels, ₩ ℔.....16¢ @ 19¢

Chucks.
Beach Patent.....each, $8.00, dis 20 %
Morse's Adjustable.....each, $7.00, dis 20 @ 20&5 %
Danbury.....each, $6.00, dis 30 @ 30&5 %
Syracuse, Bals Pat.....dis 25 %

Clamps.
Providence Tool Co.'s Wrought Iron.....dis 25 %
Adjustable, Gray's.....dis 20 %
Adjustable, Lambert's.....dis 20 %
Adjustable, Snow's.....dis 40&5 %
Adjustable, Hammer's.....dis 15 %
Adjustable, Stearns'.....dis 20&10 %
Stearns' Adjustable Cabinet and Corner...dis 20&10 %
Cabinet, Sargent's.....dis 66⅔&10 %
Carriage Makers', Sargent's.....dis 70&10 %
Ebernard Mfg. Co.....dis 40&5 @ 40&10 %
Warner's.....dis 40&10 @ 40&10&5 %
Saw Clamps.....See Vises

Clips.
Norway, Axle, ¼ & 5-16.....dis 55&5&5
Second grade Norway Axle, ¼ & 5-16.....dis 65&5
Superior Axle Clips.....dis 66⅔&5 @ 66⅔&5&5 %
Norway Spring Bar Clips, 5-16.....dis 60&5&5
Wrought-iron Felloe Clips.....₩ ℔ 5½¢
Steel Felloe Clips.....₩ ℔ 5¢
Baker Axle Clips.....dis 25 %

Cockeyes......dis 50 %

Cocks, Brass.—Hardware list.....dis 40&10&2 %

Coffee Mills.
Box and Slide, List revised Jan. 1, 1888.....dis 50&2 %
American, Enterprise Mfg. Co.....dis 20&10@30 %
The "Swift," Lane Bros'.....dis 20&10 %

Compasses, Dividers, &c.
Compasses, Calipers, Dividers.....dis 70@70&10 %
Bemis & Call Co.'s Dividers.....dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers....dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside..dis 50&5 %
Bemis & Call Co.'s Double.....dis 60 %
Bemis & Call Co.'s (Call's Patent Inside).....dis 30 %
Excelsior.....dis 50 %
J. Stevens & Co.'s Calipers and Dividers....dis 25&10 %

Coopers' Tools.
Bradley's.....dis 20 %
Barton's.....dis 20@20&5 %
L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %
Beatty's.....dis 40 @ 40&5 %
Sandusky Tool Co.....dis 30 @ 30&5 %

Corkscrews.
Humason & Beckley Mfg. Co.....dis 40 @ 40&10 %
Clough's Patent.....dis 33⅓ @ 33⅓&5 %
Howe Bros. & Hulbert.....dis 35 %

Corn Knives and Cutters.
Bradley's.....dis 10 %
Wadsworth's.....dis 25 %

Cradles.—Grain.....dis 50&5 %

Crow Bars.—Cast Steel.....₩ ℔ 4¢
Iron, Steel Points.....₩ ℔ 3½¢

Curry Combs.
Fitch's.....dis 50&10 @ 50&10&10 %
Rubber.....₩ doz $10.00, dis 20 %
Perfect.....dis %

Curtain Pins.
Silvered Glass.....net
White Enamel.....net

Cutlery.
Beaver Falls and Booth's.....dis 33⅓ %
Wostenholme.....$7.75 to $

Dampers, &c.
Dampers, Buffalo.....dis 50 %
Buffalo Damper Clips.....dis 50 %
Crown Damper.....dis 40 %
Excelsior.....dis 40&10 %

Dividers—See Compasses.

Dog Collars.
Embossed Gilt, Pope & Stevens' list.....dis 30&10 %
Leather, Pope & Stevens' list.....dis 40 %
Brass, Pope & Stevens' list.....dis 40 %

Door Springs.
Torrey's Rod, regular size.....₩ doz $1.30
Gray's.....₩ gro, $20.00, dis 20 %
Bee Rod.....₩ gro, $20.00, dis 20 %
Warner's No. 1, ₩ doz. $2.50; No. 2, $3.30, dis 40&10@50 %
Gem (Coil), list April 19 1886.....dis 10 %
Star (Coil), list April 19, 1886.....dis 20 %
Victor (Coil).....dis 60 @ 60&10 %
Champion (Coil).....dis 60&10 @ 60&10&10 %
Philadelphia.....5 in., $5.00; 8 in., $7.75, dis 30 %
Cowell's.....No. 1, ₩ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete.....₩ doz $4.50, dis 55&10 %
Hercules.....dis 50 %
Shaw Door Check and Spring.....dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring.....dis 25 %

Drawing Knives.
P, S. & W., New Haven and Middlesex, Mix.....{ dis 75&5 @ 75&10 %
Merrill.....dis 60&10&10 %
Witherby and Douglass.....dis 75&75&5 %
Watrous.....dis 15&10 @ 25 %
L. & I. J. White.....dis 20&5 %
Bradley's.....dis 35 %
Adjustable Handle.....dis 25 @ 83⅓&5 %
Wilkinson's Folding.....dis 25 @ 25&10 %

Drills and Drill Stocks.
Blacksmiths'.....each, $1.75
Blacksmiths' Self-Feeding.....each, $7.50, dis 20 %
Breast, P. S. & W.....dis 40&10 %
Breast, Wilson's.....dis 30&5 %
Breast, Millers Falls.....each, $5.00 dis 25 %
Breast, Bartholomew's... each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's.....dis 20 @ 20 & 5 %
Ratchet, Ingersoll's.....dis 25 %
Ratchet, Parker's.....dis 20 @ 20&5 %
Ratchet, Whitney's.....dis 20&10 %
Ratchet, Weston's.....dis 20@25 %
Ratchet, Moore's Triple Action.....dis 25 & 30 %
Whitney's Hand Drill, Plain, $11.00, Adjustable, $12.00.....dis 20&10 %
Wilson's Drill Stocks.....dis 1[illegible]
Automatic Boring Tools.....each, $1.75 @ $1.86
Twist Drills—
Morse's.....dis 50&10&5 %
Standard.....dis 50&10&5 %
Syracuse.....dis 50&10&5 %
Cleveland.....dis 50&10&5 %
Williams.....dis 50&10&10 %

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans.
Small sizes.....₩ ℔ 6¾¢
Large sizes.....₩ ℔ 6¼¢

Egg Beaters.
Dover.....₩ doz., $2.00
National.....₩ doz $4.50, dis 33⅓&5
Family (T. & S. Mfg. Co.).....₩ gro, $17.00@$18.00
Kingston (Standard Co.).....₩ gro, $6.50
Acme (Standard Co.).....₩ gro, 7.00
Duplex (Standard Co.).....₩ gro, $15.00
Duplex, extra heavy.....₩ doz extra $5 00
Rival (Standard Co.).....₩ gro, $.2.00
Triumph (T. & S. Mfg. Co.).....₩ gro, 10.50@11.50
Advance No. 1.....₩ gro $10.50
Advance, No. 2.....₩ gro $10.00
Bryant's.....₩ gro $15 00
Ayres' Spiral.....₩ gro $5
Double (Hamblin & Russell Mfg Co.).....₩ gro, $16 20
Easy (Hamblin & Russell Mfg. Co.).....₩ gro, $14.00
Triple (Hamblin & Russell Mfg. Co.).....₩ gro, $16.20
Spiral (Hamblin & Russell Mfg. Co.).....₩ gro, $4.50
Paine, Diehl & Co's.....₩ gro $24.00

Egg Poachers.
Buffalo Steam Egg Poachers, ₩ doz., No. 1, $6.00; No. 2, $9.00.....dis 25 %

Electric Bell Sets.—Wollensak's.....dis 15 %
Bigelow & Dowse.....dis 20&5

Emery.

	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF FF.
Kegs, ₩ ℔	4 ¢	5 ¢	2½¢
½ kegs, ₩ ℔	4½¢	5½¢	2¾¢
¼ kegs, ₩ ℔	4¾¢	5¾¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6¾¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7¾¢

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Iron, list Nov. 11, 1885.....dis 50&10 @ 50&10&5
Brass.....dis 60 @ 60&5 %

Escutcheons.
Door Lock.....Same discounts as Door Locks
Brass Thread.....dis 60 @ 60&10 %
Wood.....dis 25 %

Faucets.
Fenn's.....dis 40 %
Bohren's Patent Rubber Ball.....dis 25 %
Fenn's Cork Stops.....dis 33⅓ %
Star.....dis 60 @ 60&5 %
Frary's Patent Petroleum.....dis 40&5&2 %
West's Patent Key.....dis 50&10 %
Anchor Lock.....dis 45 %
Metallic Key, Leather Lined..dis 60&10 @ 60&10&10 %
Cork Lined.....dis 70&5 @ 70&10 %
Burnside's Red Cedar.....dis 50 %
Burnside's Red Cedar, bbl lots.....dis 50&10 %
J. Sommer's Peerless Best Block Tin Key.....dis 40 %
J. Sommer's IXL, 1st quality, Cork Lined.....dis 50 %
J. Sommer's Diamond Lock.....dis 40 %
J. Sommer's Perfection, Fla. Red Cedar.....dis 50 %
J. Sommer's Goodenough Cedar.....dis 60 %
Self-Measuring, Enterprise...₩ doz $36.00—dis 20&10 %
Self-Measuring, Lane's.....₩ doz $36.00—dis 25&10 %
Self-Measuring, Victor.....₩ doz $36.00—dis 25&10 %

Felloe Plates......₩ ℔ 6 @ 6¼¢

Fifth Wheels.—Derby and Cincinnati..dis 45&5 %

Files.
Domestic—
Nicholson Files, Rasps, &c.....dis 60&5 @ 60&10 %
Nicholson (X. F.) Files.....dis 25 %
Nichols n's Royal Files (Seconds)dis 75 (extra prices on certain sizes.)
Other makers, best brands.....dis 60&5 @ 60&10&5 %
Fair brands.....dis 60&10&10 @ 70 %
Second quality.....dis 70&5 @ 70 %
Heller's Horse Rasps.....dis 50&10 %
McCaffrey's Horse Rasps.....dis 50&10 %
Imported—
J. & Riley Carr.....List, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps.....dis 10 %
Moss & Gamble.....List April 1, 1883, dis 15 %
Butcher.....Butcher's list, dis 20 %
Stubs.....Stubs list, dis 25 @ 30 %
Turton's.....Turton's list dis. 20 @ 25 %
Greaves' Horse Rasps.....American list d 60 %

Fluting Machines.
Knox, 4¼-inch Rolls.....$3.25 each
Knox, 6-inch Rolls.....$5.00 each } dis 35 %
Eagle 3¼-inch Roll.....$2.15, dis 35 %
Eagle, 5¼-inch Roll.....2.85, dis 35 %
Crown, 4¼ in., $3.50; 6-in, $4.00; 8-in., $5.50 each, dis 35 %
Crown Jewel.....6-in., $2.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter.....$1.50 each, net
Geneva Hand Fluter, White Metal..₩ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10, dis 30 %
Shepard Hand Fluter, No. 85.....₩ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110.....₩ doz $11, dis 40 %
Shepard Hand Fluter, No. 95.....₩ doz $8, dis 40 %
Clark's Hand Fluter.....₩ doz $15.00, dis 35 %
Combined Fluter and Sad Iron...₩ doz $15.00, dis 30 %
Buffalo.....₩ doz $10.00, dis 10 %

Fluting Scissors......dis 45 %

Fly Traps.
Paragon.....₩ doz $1.50 @ 1.75

Fodder Squeezers.
Blair's.....₩ doz $2.00
Blair's, "Climax".....₩ doz $1.25

Forks.—Hay, Manure, &c., Asso. list.....dis 60&5 %
Hay, Manure, &c., Phila. list.....dis 60 @ 60&5 %
Plated, see Spoons.

Freezers, Ice Cream.
Buffalo Champion.....dis 60&10&5 %
Shepard's Lightning.....dis 60 %
White Mountain.....dis 60 %

Fruit and Jelly Presses.
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Henis.....₩ doz $4.50
P. D. & Co.....₩ doz $4.50
Shepard's Queen City.....dis 40 %

Fry Pans.
High List.....dis 75&5 @ 75&10&5 %

No.	0	1	2	3	4	5	6	7	8
₩ doz.	$3.75	4.70	5.30	5.95	6.55	7.50	8.75	10.00	11 25

Low List.....dis 70&10 %

No	0	1	2	3	4	5	6	8
₩ doz.	$3.00	3.75	4.25	4.75	5.25	6 00	7.00	9.00

Fuse......₩ 1000 ft.
Common Hemp Fuse, for dry ground.....$2.70
Common Cotton Fuse, for dry ground.....2.85
Single Taped Fuse, for wet ground.....4 75
Double Taped Fuse, for very wet ground.....6.00
Triple Taped Fuse, for very wet ground.....7.25
Small Gutta Percha Fuse, for water.....7.50
Large Gutta Percha Fuse, for water.....12.00

Gauges.
Marking Mortise, &c.....dis 60&10 %
Wire, low list.....dis 10&10 ¢
Wire, Wheeler, Madden & Co.....dis 10 %
Wire, Morse's.....dis 50 @ 50&5 %
Wire, Brown & Sharpe's.....dis 10 @ 20 %

Gimlets.—Nail and Spike.....dis 50&10&5 %
"Eureka" Gimlets.....dis 40&10 %
"Diamond" Gimlets.....₩ gross $5.00
Double Cut, Shepardson's.....dis 45 @ 45&5 %
Double Cut, Ives'.....dis 60 @ 60&5 %
Double Cut, Douglass'.....dis 40&10 %
"Bee".....₩ gross $12, dis 25 @ 25&5 %

Glue.—Le Page's Liquid.....dis 25 @ 25&5 %
Upton's Liquid.....dis 35 %
W. N. Le Page's Improved Liquid Glue..dis25 @ 25&5 %

Glue Pots.
Tinned and Enameled.....dis 40&5 @ 40&10%
Family, Howe's "Eureka".....dis 40 %
Family L. F. & C.'s "Handy".....dis 50 %

Grindstones
Small at factory.....₩ ton $7.50 @ 9.0

Grindstone Fixtures.
Sargent's Patent.....dis 70&10 %
Reading Hardware Co.....dis 30&10 %

Hack Saws.—See Saws.

Halters.—Covert's, Rope, ¼-in. Jute.....dis 50&2 %
Covert's, Rope, ¼-in., Hemp.....dis 40&2 %
Covert's Adj. Rope Halters.....dis 40&2 %
Covert's Hemp Horse and Cattle Tie.....dis 50&2 %
Covert's Jute Horse and Cattle Ties.....dis 60&10&2 %

Hammers.
Handled Hammers.
Maydole's.....List Dec. 1, 1885, dis 25 @ 25&1 0%
Buffalo Hammer Co., C. Hammond & Son, Humason & Beckley, Atha Tool Co.....{ List Jan. 15, '87 Dis. 50 @ 50& 10 %
Fayette R. Plumb.....dis 40&10 @ 50
Verree.....dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.dis 30&10 %
Nelson Tool Works.....dis 40&10 %
Warner & Nobles.....dis 20 @ 25 %
Peck, Stow & Wilcox.....dis 40 %
Sargent's.....dis 33⅓&10 %
Heavy Hammers and Sledges—
3 ₩ and under.....₩ ℔ 40¢
3 to 5 ₩.....₩ ℔ 36¢ } dis 70 & 10 @ 75 %
Over 5 ₩.....₩ ℔ 30¢
Wilkinson's Smiths'.....10½¢ @ 11¢ ₩ ℔

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ₩ doz..dis 10%
Providence Tool Co., Leg Irons, $25.00 ₩ doz....dis 10%
Tower's.....dis 25 %
Daley's Improved Hand Cuffs: 2 Hands, Polished, ₩ doz, $48; Nickeled, $57; 3 Hands, Polished, ₩ doz. $72; Nickeled, $84.....dis 25 %

Handles.
Iron, Wrought or Cast.—
Door or Thumb.

Nos.	0	1	2	3	4	
Per doz.	$0.90	1.00	1.18	1.35	1.50	dis 60&10&10

Roggin's Latches.....₩ doz. 30¢ @ 3
Bronze Iron Drop Latches.....₩ doz. 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door.....₩ doz. $1.40, dis 10&10 %
Chest and Lifting.....dis 70 %
Handles, Wood—
Saw and Plane.....dis 40&10 @ 40&10&5 %
Hammer, Hatchets, Axe, Sledge, &c.....dis 35 %
Brad Awl.....₩ gross $2.00
Hickory Firmer Chisel, assorted.....₩ gross 4.50
Hickory Firmer Chisel, large.....₩ gross 5.00
Apple Firmer Chisel, assorted.....₩ gross 5.00 } dis
Apple Firmer Chisel, large.....₩ gross 6.00 } dis
Socket Firmer Chisel, assorted.....₩ gross 3.00 } dis
Socket Framing Chisel, assorted.....₩ gross 5.00 } dis
J. B. Smith Co.'s Pat. File.....dis 50 %
File, assorted.....₩ gross 2.75 } dis 40 @ 40&10 %
Auger, assorted.....₩ gross 5.00
Auger, large.....₩ gross 7.00
Patent Auger, Ives'.....dis 30&10 %
Patent Auger, Douglass'.....₩ set $1.25 net
Patent Auger, Swan's.....₩ set $1.00 net
Hoe, Rake, Shovel, &c.....dis 50&10 %
Cross Cut Saw Handles—
Atkins' No. 1 Loop, ₩ pair, 30¢ No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles.....50¢, dis 60 %
Champion.....15¢

Hangers.
Barn Door, old patterns.....dis 60&10&10 @ 70 %
Barn Door, New England.....dis 60&10&10 @ 70 %
Samson Steel Anti-Friction.....dis 55 %
Orleans Steel.....dis 55 %
Hamilton Wrought Wood Track.....dis 55 %
U. S. Wood Track.....dis 60 %
Champion.....dis 60&10 %
Rider and Wooster, Medina Mfg. Co.'s list...dis 70 %
Climax Anti-Friction.....dis 55 %

Climax Steel Anti-Friction.....dis 50 %
Zenith for Wood Track.....dis 55 %
Reed's Steel Arm.....dis 50 %
Challenge, Barn Door.....dis 50 %
Sterling Improved (Anti-Friction).....dis 45&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18.....dis 50&10 %
Cherityree.....dis 50&10 %
Kidder's.....dis 50&10 @ 60 %
The "Boss".....
Best Anti-Friction.....dis 60 %
Duplex (Wood Track).....dis 60 %
Terry's Patent.....₩ dos. pr. 4 in. $10; 5 in., $12.....dis 50&5 %
Cronk's Patent....No. 4, $12; No. 5, $14.40; No. 6, $18.....dis 50&10 @ 60 %
Wood Track Iron Clad.....₩ ft. 10¢. dis 50&10 @ 60 %
Carrier Steel Anti-Friction.....dis50 @ 50&5 %
Architect.....₩ set $6.00, dis 20 %
Eclipse.....dis 20&10
Feilx.....₩ set $4.50, dis 20 %
Richards'.....dis30@30&10 %
Lane's Steel Anti-Friction.....dis 40&10 %
The Ball Bearing Door Hanger....dis 20&10 @ 25&10 %
Warner's Patent.....dis 20@20&10 %
Stearns' Anti-Friction.....dis 20 @ 20&10 %
Stearns' Challenge.....dis 25&10 @ 25&10&10 %
Faultless.....dis 40 @ 40&c %
American.....₩ set $6; dis 20&10 %
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....dis 40 %
Paragon, Nos. 1, 2 and 3.....dis 40&10 %
Paragon, Nos. 5, 6½, 7 and 8.....dis 20&10 %
Crescent.....dis 60@60&10 %
Nickel, Cast Iron.....dis 50 %
Nickel, Malleable Iron and Steel.....dis 40 %
Scranton Anti Friction Sing'e Strap.....dis 33⅓ %
Scran-on Anti-Friction Double Strap.....dis 40 %
Universal Anti Friction.....dis 40 %
Wild West, 4 in. wheel, $15; 5 in. wheel, $21.....dis 45 %
Star.....dis 4 &10 @ 40&10&5 %
May.....dis 50&5 @ 50&10 %

Harness Snaps.—See Snaps.

Hatchets.—List Jan. 1, 1886.

Isaiah Blood.....dis 35 @ 40%
Hunt's Shingling Lath and Claw.....dis 40&5 %
Hunt's Broad.....dis 40 %
Buffalo Hammer Co.....dis 40&10@50 %
Hurd's.....dis 40&10 @ 50 %
Fayette R. Plumb.....dis 40&10 @ 50 %
Wm. Mann, Jr., & Co.....dis 50 @ 50&55
Underhill Edge Tool Co.....dis 40&5 @ 40&10 %
Underhill's Haines and Bright goods.....dis 33⅓ %
C. Hammond & Son.....dis 40&10 @ 50 %
Simmons.....dis 40&10 @ 50 %
Peck's.....dis 40&10 @ 40&10&5 %
Kelly's.....dis 50@50&5 %
Sargent & Co.....d's 60 %
Ten Eyck Edge Tool Co.....dis 40&10@40&10&5 %
Collins, following list.....dis 10 %
Shingling, Nos. 1 2 3.....₩ doz $5.50 $6.00 $6.50
Claw, Nos. 1 2 3.....₩ doz 6.00 6 50 7.00
Lathing Nos. 1 2 3.....₩ doz 5.50 6.00 6.50

Hay Knives.

Lightning.....Mfrs. price ₩ doz $18, d's 25 % Jobber's Extras
Electric.....₩ doz $17 } dis 30 @
Gem.....₩ doz $18 } 30&5 %
Wadsworth's.....dis 40&7½ @ 40&10 %
Carter's Needle.....₩ doz $11.50 @ $12.00
Heath's.....₩ doz $13.50 @ $14.00

Hinges.

Wrought Iron Hinges—

Strap and T.....dis 70&10&5 @ 70&10&10 %
Screw Hook and Strap: (6 to 12 in. ₩ ℔.....3¢; 14 to 20 in. ₩ ℔.....3½¢; 22 to 36 in., ₩ ℔.....2½¢)
Heavy Welded Hook: (6 to 12 in., ₩ ℔.....3½¢; 14 to 20 in., ₩ ℔.....3½¢; 22 to 36 in. ₩ ℔.....2½¢)
Screw Hook and Eye.....(½ in.....₩ doz $1.50) (⅝ in.....₩ doz $2.45) dis 10% (¾ in.....₩ doz $3.80)
Rolled Blind Hinges, Nos 22 and 84.....dis 50&10
Rolled Blind Hinges, Nos. 232 and 234.....dis 55&10 %
Rolled Plate.....dis 70&10 %
Rolled Raised.....dis 70&10
Plate Hinges 8, 10 & 12 in., ₩ ℔.....5
"Providence" } over 12 in., ₩ ℔.....4

Spring Hinges—

Geer's Spring and Blank Butts.....dis 40 %
Union Spring Hinge Co.'s list, March, 1886.....dis 20 %
Acme and U. S.....dis 30 %
Empire and Crown.....dis 20 %
Hero and Monarch.....dis 50 %
American, Gem, and Star, Japanned.....dis 20 %
American, Gem, and Star, Bronzed.....net
Oxford, Bronze and Brass.....net
Barker's Double Acting.....dis 20&10 %
Union Mfg. Co.....dis 25 %
Bommer's.....dis 30 %
Buckman's.....dis 15@20 %
Chicago.....dis 30 %

Gate Hinges—

Western.....₩ doz $4.40, dis 55 %
N. E.....₩ doz $7.00, dis 55 %
N. E. Reversible.....₩ doz $5.20, dis 55&10 %
Clark's, Nos. 1 2 3.....dis 60&10&5 %
N. Y. State.....₩ doz $5.00, dis 55&10 %
Automatic.....₩ doz $12.50, dis 50 %
Common Sense.....₩ doz pair $4.50, dis 50 %
Seymour's.....dis 45&10 %
Shepard's.....dis 60&10&5 %
Reed's Latch and Hinges.....₩ doz sets $12, dis 50 %

Blind Hinges—

Parker.....dis 75&2 %
Palmer.....dis 50&5&10 %
Seymour.....dis 70&2 %
Nicholson.....dis 45&10 %
Huffer.....dis 50 %
Clark's, Nos. 1, 3, 5, 40 and 50.....dis 75&10&5@80 %
Clark's Mortise Gravity.....dis 50 %
Sargent's, Nos. 1, 3, 5, 11, 13...dis 75&10@75&10&5 %
Sargent's, No. 12.....dis 75&10&10 %
Reading's Gravity.....dis 75&10 @ 75&10&5 %
Shepard's Nonsetens Sl'gara Buffalo, Champion, Steamboat, Clark's Old Pattern and Clark's Tip Pattern.....dis 7o&10&5 %
Shepard's O. S, Lull & Porter.....dis 75&10 %
Shepard's Acme, Lull & Porter.....dis 75&5 %
Shepard's Queen City Reversible.....dis 75 %
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....dis 75&10&2½ %
North's Automatic Blind Fixtures. No. 2, for Wood, $10.50; No. 3, for Brick, $13.50....dis 25&2 %

Hoes.

Handled—

Garden, Mortar, &c.....dis 65&5 %
Planter's, Cotton, &c.....dis 65&5 %
Warren Hoe.....dis 60 %
Magic.....₩ dos $4.2

Eye—

D. & H. Scovil.....dis 20 %
Lane's Crescent Scovil Pattern.....d.s 45 %
Lane's Crescent Planters Pattern.....dis 45 & 5 %
Lane's Razor Blade, Scovil Pattern.....dis 30 %
Maynard. S. & O. Pat.....dis 45&5 %
Sandusky Tool Co., " " .....dis 60 %
Hubbard & Co., " " .....dis 60 %
Bare " " .....dis 60 %
Grub.....dis 60 @ 60&10 %

Hog Rings and Ringers.

Hill's Improved Ringers.....₩ doz. $4.50
Hill's Old Style Ringers.....₩ doz. $3.00
Hill's Tongs.....₩ doz. $4.50
Hill's Rings.....₩ doz boxes, $2.25@ 2.40
Perfect Rings.....₩ doz boxes $1.75 @ 2.00
Perfect Ringers.....₩ doz. $2.50
Blair's Hog Ringers.....₩ doz, $2.50 @ $2.65
Blair's Hog Rings.....₩ doz 9b¢ @ 1.0
Champion Ringers.....₩ doz $2.00
Champion Rings, Double.....₩ doz, $2.25
Brown's Ringers.....₩ doz, $2.00
Brown's Rings.....₩ doz. $1.25 @ 1.30

Hoisting Apparatus

"Moore's" Hand Hoist, with Lock Brake.....dis 70 %
"Moore's" Differential Pulley Block.....dis 40 %

Holders, File and Tool.

Ralz Pat.....₩ dos $4; dis 25 %
Nicholson File Holders.....dis 20 %

Hollow-Ware.

Iron—

Stove Hollow-Ware. Ground...dis 60&10@60&10&5 %
Stove Hollow-Ware. Unground....dis 70&5@70&10 %
Enameled and Tinned Hollow-Ware—
Kettles.....dis 70 @ 70&5 %
Oval Boilers, Saucepans & Glue Pots.....dis 40&5 @ 40&10 %
Gray Enameled Ware.....dis 10 @ 40&5 %
Agate and Granite Ware.....dis 25 %
Rustless Hollow-Ware.....dis 50 @ 50&5 %
Galvanized Tea-Kettles—

Inch.....	6	7	8	9
Each.....	55¢	60¢	65¢	75¢

Silver Plated—4 mo. or 5 % cash in 30 days.

Reed & Barton.....dis 40&5 %
Meriden Brittania Co.....dis 40&5 %
Simpson, Hall, Miller & Co.....dis 40&5 %
Rogers & Brother.....dis 40&5 %
Hartford Silver Plate Co.....dis 40&5&5 %
William Rogers Mfg. Co.....dis 40&5&5 %

Hooks.

Cast Iron—

Bird Cage. Sargent's list.....dis 60@10&10 %
Bird Cage, Reading.....d's 60&10&10 %
Clothes Line. Sargent's list.....dis 60&10&10 %
Clothes Line, Reading list. dis 60&10 @ 60&10&10 %
Ceiling, Sargent's list.....dis55&10&10 %
Harness, Reading list.....dis 55&10 @ 55&10&10 %
Coat and Hat, Sargent's list.....dis 55&10 @ 60&10 %
Coat and Hat, Reading.....dis 50&10 @ 50&10&10 %

Wrought Iron—

Cotton.....₩ dos $1.2
Cotton Pat. (N. Y. Mallet & Handle W'ks).....dis 50 %
Tassel and Picture (T. & S. Mfg. Co.).....dis 50 %
Wrought Staples, Hooks, &c.....See Wrought Goods
Bench Hooks.....See Bench Stops

Wire—

Wire Coat and Hat, Gem, list April, 1886.....dis 45 %
Wire Coat and Hat Miles', list April, 1886.....dis 45
Indestructible Coat and Hat.....dis 45 %
Wire Coat and Hat, Standard.....dis 45 %
Belt.....dis 75&10 @ 80 %
Grass.....₩ dos $2.0
Sush.....dis 55 @ 60 %
Whiffletree—Patent.....dis 55 %
Hooks and Eyes—Malleable Iron.....dis 70 @ 70&10 %
Hooks and Eyes—Brass.....dis 60&10&10 %
Fish Hooks, American.....dis 50 %

Horse Nails.

Nos.	6	7	8	9	10	
Ausable.....	28¢	26¢	25¢	24¢	23¢.	dis 25&10@25&10&10 %
Clinton. Fin.	24¢	22¢	21¢	20¢	19¢	.....dis 40&10 @ 50 %
Essex.....	28¢	26¢	25¢	24¢	23¢.	dis25&10@25&10&10 %
Lyra.....	25¢	23¢	22¢	21¢	20¢	....dis 40&10&r@50 %
Snowden.....	25¢	23¢	22¢	2..¢	20¢	....dis 40&10&5@50 %
Putnam.....	24¢	22¢	21¢	20¢	19¢.	...dis 5&10&2½@2½ %
Vulcan.....	23¢	21¢	20¢	19¢	18¢.	..... dis 12½&5
Northwest'n.	25¢	23¢	22¢	21¢	20¢.	.....dis 10&10&5&5
Globe.....	25¢	21¢	20¢	19¢	18¢.	..... dis 12½&5&5
A. C.....	25¢	23¢	22¢	21¢	20¢.	dis 25&10 @ 83½&5 %
C. B.-K.....	25¢	23¢	22¢	21¢	20¢.	dis 25&10 @ 33½&5
Champlain.	28¢	26¢	25¢	24¢	23¢.	.....dis25&10&10 %
New Haven.	28¢	26¢	25¢	24¢	23¢	dis25&10@25&10&10 %
Saranac.....	28¢	21¢	20¢	19¢	18¢.	..... dis 90&10 %
Champion.	25¢	23¢	22¢	21¢	20¢.	..... dis 10&10&10
Capewell.	28¢	26¢	25¢	24¢	23¢.	...dis 35&5 @ 35&10
Star.....	23¢	21¢	20¢	19¢	18¢.	dis 10&10@10&1½ %
Anchor.....	23¢	21¢	20¢	19¢	18¢.	..... dis 35 %
Western.....	23¢	21¢	20¢	19¢	18¢.	.....dis 40&10 %
Empire Bronzed.....						14 per lb.

Horse Shoes—See Shoes, Horse.

Hose. Rubber, competition...75&10 @ 75&10&5 %
Standard.....dis 70@7 &10 %
Extra.....dis 60 @ 60&10 %
N. Y. B. & P. Co., Para.....dis 30&10 %
N. Y. B. & P. Co., Extra.....dis 50 %
N. Y. B. & P. Co., Dundee.....dis 60&10&5 %

Huskers.

Blair's Adjustable.....₩ gross $8.00
Blair's Adjustable Clipper.....₩ gross 7.00

Ice Picks, Chisels, &c.

Am. Ice Chisel Pol'd. ...₩ dos $3.00, dis 3' @20&5 %
National Ice Chisel.....₩ dos $6.25, dis 20 %
Novelty Ice Breakers.....₩ dos $6.25, dis 20 %
Dunlap's Ring Picks.....₩ dos $2.00, dis 15 %
Wood Head Picks Sargent's....₩ dos $1.60, dis 50&10 %
Iron Head Picks, Sargent's.....₩ dos $1.25, dis 50&10 %
Ice Mallets, Pick in handle.....₩ dos $2.00, dis 15 %
Ice Axes, Small Cast or Mall...₩ dos $1.25, dis 20&10 %
Comb'nation Ice Tools.....₩ dos $2.00 ne
Acme Pick and Tongs...₩ gross $55.00, dis 50&10 %
Roger's Lightning Ice Chisel.....₩ gross $28.50

Ice Tongs.

Champion, S. S. & Co.....₩ dos $4.00, dis 35&10 %
Family.....₩ dos $2.70, dis 20@25 %

Jack Screws.—See Screws.

Kettles.

	Spun.	Stamped.
Brass, 7 to 17 in., ₩ ℔.....	24¢	21 ¢
Brass larger than 17 inches, ₩ ℔..	28¢	23½¢
Enameled and Tea Kettles.....	See *Hollow-Ware*	

Keys.

Lock Asso'n list Dec. 30. 1886.....dis 50&10 @ 60&5 %
Eagle, Cabinet, Trunk and Padlock.....dis 33½&2 %
Hotchkiss' Brass Blanks.....dis 40 %
Hotchkiss' Copper and Tinned.....dis 40 %
Hotchkiss' Padlock and Cabinet...dis 40 %
Ratchet Bed Keys.....₩ dos $4.00, dis 15 %

Knife Sharpeners.

Parkin's Applewood Handles.....₩ dos $6.00, dis 40 %
Parkin's Rosewood or Cocobolo...₩ dos $9.00, dis 40 %

Knives.

Wilson's Butcher Knives.....dis 20 @ 25 %
Ames' Butcher Knives.....dis 25 %
Nichols' Butcher Knives.....dis 40&1 %
Ames' Shoe Knives.....dis 30@25 %
Ames' Bread Knives.....₩ dos $1.50, dis 15 @ 20 %
Moran's Shoe and Bread Knives.....dis 20 %
Hay and Straw.....See Hay Knives
Table and Pocket.....See Cutlery

Knobs.

Door Mineral.....65@68
Door Por. Jap'd.....75@78
Door Por. Por. Nickel.....$2.00 @ 2.25
Door Por. Plated, Nickel.....$2.00 @ 2.25
Drawer, Porcelain.....dis 55&10&10@6. &10&10 %
Hemacite Door Knobs, new list.....dis 40&10@50 %
Yale & Towne Wood Knobs, list Dec., 1885....d's 40 %
Furniture Plain.....75¢ gross inch. dis 10 %
Furniture, Wood Screws.....dis 25&10 %
Base, Rubber Tip.....dis 70&10&5 %
Picture, Judd's.....dis 60&10&10 @ 70 %
Picture, Sargent's.....dis 70 &10 %
Picture, Hemacite.....dis 35&5 %
Shutter, Porcelain.....dis 65&10 %
Carriage, Japann. d.....₩ gross 80c. dis 60&10 %

Ladles.

Melting, Sargent's.....dis 55&10 %
Melting, Reading.....dis 35&10%
Melting, Monroe's Patent.....₩ dos. $4.00, dis 40%
Melting, P. S. & W.....dis 35&10 @ 40%
Melting, Warner's.....dis 30%

Lawn Mowers.

Standard List.....dis 50&10 %
Enterprise.....dis 60&10 %

Lanterns.

Tubular, Plain with Guards.....₩ dos $4 00 @ $4.25
Tubular, Lift Wire, with Guards...₩ doz $4 50 @ $4.75
Tubular, Square Plain with Guards, ₩ doz $4.00 @ $4.25
Tubular, Sq Lift Wire, with Guards, ₩ doz $4.25 @ $4.50
Without Guards, 25¢ ₩ dozen less.
Police, Small, $6.00; Med. $7.25; Large, $9.75. dis 20@25¢

Lemon Squeezers.

Porcelain Lined, No. 1.....₩ dos. $6.00, dis 25&30 %
Wood, No. 2.....₩ doz. $3.00, dis 35 %
Wood, Common.....₩ dos $1.70 @ 1.75
Dunlap's Improved.....₩ dos. $3.75, dis 20 %
Sammis.....No. 1, $5; 2, $9; 12, $18 ₩ dos. dis 25&10 %
Jennings' "Star".....₩ doz $2.50
The "Boss".....₩ dos $2.50
Dean's.....Nos. 1, ₩ dos $6.50; 2, $3.35; 3, $1.90
Little Giant.....dis 50 @ 50&5 %
King.....dis 40&5 %

Lines.

Cotton and Linen Fish, Draper's.....dis 50 %
Draper's Chalk.....dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25...dis 25 %
Cotton Chalk.....dis 55 %
Samson, Cotton, No. 4, $2; No. 4½, $2.50.....dis 10 %
Silver Lake, Braided, Nos. 0, $6.00 No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gross.....dis 25 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50
Masons' Colored Cotton.....dis 45
Wire Clothes, No. 18, $3.60; No 19, $3 00; No. 20, $2.50.
Ventilator Cord, Samson Braided, White or Drab Cotton.....$7.50 ₩ dos. dis 20%

Locks. Padlocks. Cabinet Locks, &c.

Door Locks, Latches, &c.—

List Dec. 30, '86, ch'gd Feb. 2, '87...dis 50&10 @ 60&5 %
Note.—Lower net prices often made.
Mallory, Wheeler Co., list July, 1888...dis 50&10&2 %
Sargent & Co. list Aug. 1, 1888).....dis 55&2&10 %
Reading Hardware Co. list Feb. 2, '88. dis 55&60&10 %
Livingston & Co.....dis 70 %
Perkins' Burglar Proof.....dis 60&25 %
Plate.....dis 33½&2 %
F. Many's "Extension Cylinder".....$10.50 ₩ doz
Barnes Mfg. Co.....dis 40 %
Yale Corrugated Key.....dis 33⅓ %
Diets Flat Key.....dis 30 %
L. & C. Round Key Latches.....dis 30&10 %
L. & C. Flat Key Latches.....dis 33⅓&10 %
Romer's Night Latches.....dis 15 %
Yale new list.....dis 33⅓ %
"Shepardson" or "U. S."..... dis 35 %
"Pelter" or "American".....dis 40&10 %
Reed's N. Y. Hasp Lock.....dis 25 %

Cabinet—

Eagle, Gaylord Parker and Corbin, } List March, '84, revised Jan. 1, '85. dis 33⅓&2 %
Deits, Nos. 36 to 39.....dis 40 %
Deits, Nos. 51 to 63.....dis 40 &10 %
Diets, Nos. 86 to 98.....d's 30 %
Stoddard Lock Co.....dis 30 @ 33⅓ %
"Champion" Night Latches.....dis 40 %
Barnes Mfg. Co.....dis 40 %
Eagle and Corbin Trunk.....dis 25&2 %
Champion" Cabinet and Combination....dis 33⅓ %
Yale.....dis 33⅓ %
Romer's.....dis 25 %

Padlocks—

List, Dec. 23, 84.....dis 70 @ 70&10 %
Yale Lock Mfg. Co.'s.....dis 33⅓ %
Eagle.....dis 25&2 %
Eureka, Eagle Lock Co.....dis 40&2 %
Romer's. Nos. 0 to 91.....dis 30 %
Romer's Scandinavian, &c, Nos. 100 to 606...dis 15 %
A. E. Diets.....dis 40 %
"Champion" Padlocks.....dis 40 %
Hotchkiss.....dis 30 %
"Star".....dis 45 %
"Horse Shoe," ₩ dos. $9.....dis 40 %
Barnes Mfg. Co.....dis 40
Nock's.....dis 30 %
Brown's Patent.....dis 25 %
Scandinavian.....dis90 %
Fraim's Pat. Scandinavian new list (low)....dis 60 %

Lumber Tools.

Ring Peavies, "Blue Line" Finish.....₩ dos $20.00
Ring Peaves, Common Finish.....₩ dos $18.00
Steel Socket Peavies.....₩ dos $21.00
Mall. Iron Socket Peavies.....₩ dos $19.00
Cant Hooks, "Blue Line" Finish.....₩ dos $16.00
Cant Hooks, Common Finish.....₩ dos $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....₩ dos $16.00
Cant Hooks, Mall. Socket Clasp Common Finish.....₩ dos $14.50
Cant Hooks, Clip Clasp, "Blue Line" Fin. ₩ dos $14.00
Cant Hooks, Clip Clasp, Common Finish. ₩ dos $12.00
Hand Spikes.....₩ dos 6 ft., $15.00; 8 ft., $20
Pike Poles, Pike & Hook, 12 ft. 14 ft. 16 ft 18 ft. 20 ft. ₩ doz.....$11.50 12.50 14.50 17.50 21.50
Pike Poles, Pike only, ₩ dos.....10.00 11.00 13.00 16.00 20.00
Pike Poles not Ironed, ₩ dos.....6.00 7.00 9.00 12.00 16.0
Setting Poles, ₩ doz.....14.00 15.00 17.00
Swamp Hooks.....₩ dos $15.00
Landing Blocks.....₩ dos $22.50
Skidding Tongs.....₩ dos $51.00
Log Binders.....₩ dos $26.00
Bended Boot Calks, 1 to 5 M, dis 25 %; 5 to 10 M, dis 30 %
Square Steel Boot Calks.....dis 40 %
Chain Rafting Dogs.....₩ 100 $12.50
Ring Rafting Dogs...₩ 100, med., $10.00; large, $12.00
Timber Grapples.....₩ dos $30.00

Lustre.

Four-ounce Bottles.....₩ dos. $1.75 ₩ gro. $17. 00

Mallets.

Hickory.....dis 20&10@20&10&10 %
Lignumvitæ.....dis 20&10@20&10&10 %
B. & L. Block Co., Hickory and L. V....dis 30 @ 30&10

Match Safes.

Dangerfield's Self-Igniting.....₩ dos $1.2

Mattocks.—Regular list.....dis 60&10 @ 60&10&5

Meat Cutters

Dixon's—Nos.....	1	2	3	4	
₩ dos.....	$14.00	17.00	19.00	30.00	dis 45 %
Woodruff's.....		Nos.	100	150	
		₩ dos.	$15.00	18.00	dis 45
Champion.....	Nos.	200	300	400	
	₩ dos.	$22.00	$7.00	40.00	dis 45
Hales' Pattern Nos.	11	12	13		
₩ dos..	$27.00	33.00	45.00		dis 70 @ 70&5 %

American.....					dis
Nos.....	1	2	3	4B	
Each.....	$5.00	7.00	10.00	25.00	50.00 60.00
Enterprise.....					dis 3
Nos.....	10	12	22	32	42
Each.....	$3	3.50	4.00	6 00	15.00

Pennsylvania.....dis 40&10%
Nos. 1 2 3 00
₩ doz. $24.00 28.00 36.00 28.00
Miles' Challenge..Nos. 1 2
₩ doz. $22.00 30.00 40.00—dis 45&45&10 %
Home No. 1.....$26 ₩ doz, dis 50&10 %
Draw Cut..Nos. 5 4 3 2
Each....$50.00 75.00 80.00 225.00—dis 20 @ 25 %
Beef Shavers (Enterprise Mfg. Co.)...dis 20&10 @ 30 %
Chadborn's Smoked Beef Cutter.....₩ doz, $66.00

Mincing Knives.
Am. (2d quality), ₩ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....dis 20&10 %
Smith's, ₩ doz, Single, $2.00; Double, $3....dis 40&45 %
Knapp & Cowles.....dis 50&10&50 %
Buffalo Adjustable.....₩ doz $3.00, dis 25 %

Molasses Gates.—Stebbins' Pat..dis 70&70 & 7½ %
Stebbins' Genuine.....dis 60&10&10 %
Stebbins' Tinned Ends.....dis 40&10 %
Chase's Hard Metal.....dis 50&10 %
Bush's.....dis 20 %
Lincoln's Pattern.....dis 66⅔&10 %
Weed's.....dis 20&10 %
Boss Nos. 1 2 3 4
$7.00 8.00 9.00 10.00. ₩ doz, dis 60&10&10 %

Money Drawers.—₩ doz., $18 @ $20.

Muzzles.—Safety, ₩ doz. $3.....dis 25 %

Nails.....See Trade Report
Wire Nails & Brads, list July 14, '87..dis 70&10 %
Wire Nails, Standard Penny.....₩ keg, $2.50 @ $2.60

Nail Puller.—Curtiss Hammer...₩ doz $9.00 net
Giant, No. 1.....₩ doz $30.00, dis 10 %
Pelican.....₩ doz $9.00, dis 25 %
Boss.....₩ doz $30, dis 30 %

Nail Sets.—Square.....₩ gro., $4.00 @ $4.25
Round.....₩ gro., $3.25
Cannon's Diamond Point.....₩ gro. $12 dis 20 %

Nut Crackers.
Table (Humason & Beckley Mfg. Co.).....dis 40 %
Blake's Pattern.....₩ doz $2.00, dis 10 %
Turner & Seymour Mfg. Co.....dis 50 %

Nuts.
Nuts, all kinds, 5½¢ off list Jan. 1, 1888.
In lots less than 100 ℔, ₩ ℔, add ½¢, 1 ℔ boxes add 1¢ to list.

Okum.
Government.....₩ ℔ 8¢
U. S. Navy.....₩ ℔ 7¢
Navy.....₩ ℔ 6¢ @ 6½¢

Oilers.—Zinc and Tin.....dis 65 @ 65&10 %
Brass and Copper.....dis 50&10@50&10&5 %
Malleable, Hammers' Improved, No 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz.....dis 10 @ 10&10 %
Malleable, Hammers, Old Pattern, same list....dis 40 %
Prior's Patent or "Paragon" Zinc.....dis 60&10&10 %
Prior's Patent or "Paragon" Brass.....dis 50 %
Olmstead's Tin and Zinc.....dis 60 %
Olmstead's Brass and Copper.....dis 50 %
Broughton's Zinc.....dis 60 %
Broughton's Brass.....dis 50 %

Packing, Steam.

Rubber—
Standard.....dis 60&10 @ 50&10&10 %
Extra.....dis 50&10 @ 60 %
N. Y. R. & P.Co., Standard.....dis 50&10&5 %
N. Y. R. & P. Co., Empire.....dis 70 %
N. Y. R. & P. Co., Salamander.....₩ ℔ 65¢, dis 30 %
Jenkins' Standard.....₩ ℔ 80¢, dis 35 %

Miscellaneous—
American Packing.....10¢ @ 11¢ ₩ ℔
Russia Packing.....14¢ ₩ ℔
Italian Packing.....13 @ 14¢ ₩ ℔
Cotton Packing.....15 @ 17¢ ₩ ℔
Jute.....7 @ 8¢ ₩ ℔

Padlocks.—See Locks.

Pails.
Galvanized Iron—

Quarts.	10	12	14
Hill's Light Weight, ₩ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₩ doz.	3.00	3.25	3.75
Whiting's.	2.75	3.00	3.25
Sidney Shepard & Co	2.67	....	3.23
Iron Clad.	2.75	3.00	3.25
Fire Buckets.	2.74	3.26	3.50

Buckets, see Wall Buckets

Indurated Fibre Ware—
Star Pails, 12 qt.....₩ doz $4.50
Fire Stable and Milk, 14 qt.....₩ doz $5.50

Pencils. Faber's Carpenters'.....high list, dis 50 %
Faber's Round Gilt.....₩ gro $5.25 net
Dixon's Lead.....₩ gro $4.50 net
Dixon's Lumber.....₩ gro $6.75 net
Dixon's Carpenters'.....dis 40&10 %

Picks.
Railroad, 5 to 6, $12.00; 6 to 7, $13, dis 60&10@60&10 &5 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13, dis 60&10@60&10&5 %

Picture Nails.
Brass Head, Sargent's list.....dis 50&10&10 %
Brass Head, Combination list.....dis 50&10 %
Porcelain Head, Sargent's list.....dis 50&10&10 %
Porcelain Head, Combination list.....dis 40&10 %
Niles' Patent.....dis 40 %

Pinking Irons......₩ doz 65¢ net

Pipe, Wrought Iron.—List March 23, 1887.
1¼ and under, Plain.....dis 55 %
1¼ and under, Galvanized.....dis 45 %
1½ and over, Plain.....dis 65 %
1½ and over, Galvanized.....dis 50 %
Boiler Tubes, Iron.....dis 52½ %

Planes and Plane Irons.
Wood Planes—
Moulding.....dis 50&10 @ 50&10&25 %
Bench, First Quality.....dis 50&10&5 @ 60&5 %
Bench, Second Quality.....dis 60&10 @ 60&10&5 %
Bailey's (Stanley R. & L. Co.).....dis 30&10 %
Iron Planes—
Bailey's (Stanley R. & L. Co.)...dis 30&10@30&10&5 %
Miscellaneous Planes (Stanley R. & L. Co.,dis 20&10 %
Victor Planes (Stanley R. & L. Co.).....dis 20& 10 %
Steer's Iron Planes.....dis 35 @ 35&5 %
Meriden Mal. Iron Co.'s.....dis 30&10@30&10&10 %
Davis's Iron Planes.....dis 30&10@30&10&10 %
Birmingham Plane Co.....dis 50@50&5 %
Gage Tool Co.'s Self-Setting.....dis 2 %
Chaplin's Iron Planes.....dis 40 @ 40 & 5 %
Sargent's.....dis 30&10 @ 30& .0&10 %
Plane Irons—
Plane Irons.....dis 20&10 %
Plane Irons, Butcher's.....$5.00 @ $5.25 to 2
Plane Irons, Buck Bros.....dis 30 %
Plane Irons, Auburn Tool Co., "Thistle".....dis 40 %
Plane Irons, Middlesex Mfg. Co., "Baldwin Iron,"
Single and Cut.....dis 20 @ 25 %
Double.....dis 33⅓ @ 40 %
L. & I. J. White.....dis 25 %

Pliers and Nippers.
Sutton's Patent.....dis 30&10 @ 40 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz dis 20&10@33⅓&5 %
Gumason & Beckley Mfg. Co.....dis 50@50&10 %
Pliers.....dis 60 %
Pliers, Custer's Nickel Plated.....dis 60&5 %
Eureka Pliers and Nippers.....dis 40 %
Russell's Parallel.....dis 25 %
S. & W. Cast Steel.....dis 50 %
S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %
Farrar's Pat. Wire Cutters.....dis 20 %
Morrill's Parallel, per doz., $12.....dis 40 %
Cronk's 5 in., $15; 10 in., $21.....dis 40 @ 40&5 %

Plumbs and Levels.
Regular List.....dis 70&10@70&10&10 %
Disston's.....dis 45&10 %
Pocket Levels.....dis 70&10@70&10&10 %
Davis Iron Levels.....dis 30 %
Davis' Inclinometers.....dis 10&10 %

Poppers, Corn.
Round or Square, 1 qt.....₩ gro $12 @ $15
Round or Square, 2 qt.....₩ gro $25 @ $26

Post Hole and Tree Augers and Diggers.
Jamson Post Hole Digger.....₩ doz $36.00, dis 25&10 %
Fletcher Post Hole Augers.....₩ doz $36.00, dis 20 %
Eureka Diggers.....₩ doz $16 @ $17
Reed's.....₩ doz $8.00 @ $9.00
Vaughan's Post Hole, Auger, per doz....$13 00 @ $14.00
Cohler's Little Giant.....₩ doz $18.00
Kohler's Hercules.....₩ doz $15.00
Kohler's New Champion.....₩ doz $9.00
Schneidler.....₩ doz $18
Ryan's Post Hole Diggers.....₩ doz $24
Cronk's Post Bars.....₩ doz $60, dis 50&5 @ 50&10 %
Gibb's Post Hole Digger, ₩ doz $30....dis 40 @ 40&10 %

Potato Parers.
White Mountain.....₩ doz $5.00 @ 5.50
Antrim Combination.....₩ doz $8.00
Rodeier.....₩ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw, ₩ doz $18.00.....dis 20&10 %
Disston's Pruning Hook.....₩ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruning Tools.....dis 40 %
Pruning Shears, Henry's Pat...₩ doz $3.75 @ $4.00 net
Henry's Pruning Shears.....₩ doz $4.25 @ $4.50 net
Wheeler, M. & Co.'s Combination...₩ doz $12, dis 20 %
Dunlap's Saw and Chisel.....₩ doz $8.50, dis 30 %
J. Mallinson & Co.....No. 1, $5.25; No. 2, $7.25

Pulleys.—Hot House, Awning, &c.....dis 60&10 %
Japanned Screw.....dis 60&10 %
Brass Screw.....dis 60&10 %
Japanned Side.....dis 66⅔&10 %
Japanned Clothes Line.....dis 60&10 %
Empire Sash Pulley.....dis 55 @ 60 %
Moore's Sash, Anti Friction.....dis 50 %

Hay Fork, Solid Eye, $4.00; Swivel, $4.50 } dis 50&10
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70.....dis 50 % } @ 50&10&5 %
Hay Fork, "F" Common and Pat. Bushed.....dis 20 %
Hay Fork, Tarbox Pat. Iron.....dis 20 %
Hay Fork, Reed's Self Lubricating.....dis 60 %
Shade Rack.....dis 45 %
Tackle Blocks.....See Blocks

Pumps.—Cistern, Best Makers.....dis 50 @ 10&60 %
Pitcher Spout, Best Makers...dis 60&10 @ 60&10&10 %
Pitcher Spout, Cheaper Goods...dis 70&5 @ 70&10&5 %

Punches.
Saddlers' or Drive, good quality.....₩ doz 60¢ @ 65¢
Semis & Call Co.'s Cast Steel Drive.....dis 50&5 %
Semis & Call Co.'s Springfield Socket.....dis 50&5 %
Spring, good quality.....₩ doz $2.50 @ $2.60
Spring, Leach's Patent.....dis 15 %
Semis & Call Co.'s Spring and Check.....dis 40 %
Solid Tinners'.....₩ doz $1.44, dis 55 %
Tinners' Hollow Punches.....dis 90&2 %
Rice Hand Punches.....dis 15 %

Rail.
Sliding Door, Wrt. Brass ₩ ℔ 85¢.....dis 15 %
Sliding Door, Bronzed Wrt. Iron.....₩ foot 7¢
Sliding Door Iron, Painted....₩ foot 4¢, dis 20&10&5 %
Barn Door, Light...Inch. ⅜ ½ ¾
Per 100 feet..... $2.50 3.00 4.40—dis 10 %
Malleable for N. E. Hangers—

	Small.	Med.	Large
Per 100 feet	$2.15	2.70	3.25 net

Ferry's Wrought Iron, ₩ foot.....4½¢ @ 5¢
Victor Track Rail, 7¢ ₩ foot.....dis 50&2 %
Carrick Steel Rail, per foot.....4½¢

Rakes.
Cast Steel.....dis 65&5 @ 70 %
Malleable.....dis 70 @ 70&5 %
Gibbs Lawn Rake.....$12, dis 40 %
Canton Lawn Rake.....$9, dis 40 %
Ft. Madison Prize Bow Brace and Peerless..dis 65&5 %
Fort Madison Steel Tooth Lawn Rake, $9.....dis 25 %

Razors.—J. R. Torrey Razor Co.....dis 20%
Wostenholme and Butcher.....$10 to £, dis 10 %

Razor Strops.
Genuine Emerson.....dis 60 @ 60&5 %
Imitation Emerson.....₩ doz $2.00, dis 20&10&5 %
Torrey's.....dis 20 %
Badger's Belt and Combination.....₩ doz $2
Lamont Combination.....₩ doz $4

Rivets and Burrs.
Copper.....dis 50 @ 50&10 %
Iron, list November 17, 1887.....dis 50 @ 50&7½ %

Rivet Sets.....dis 50&2 @ 50&10 %

Rods.—Stair, brass.....dis 2&&2 %
Stair Black Walnut.....₩ doz 40¢

Rollers.
Barn Door, Sargent's list.....dis 60&10&10 %
Acme (Anti-Friction).....dis 55 %
Union Barn Door Roller.....dis 70 %

Rope.—Manufacturers' prices for large lots.
Manila.....⅝ inch and larger ₩ ℔ 11½¢ net
Manila.....½ inch ₩ ℔ 12¢ net
Manila.....⅜ and 5-16 inch ₩ ℔ 12½¢ net
Manila Tarred Rope.....₩ ℔ 11¢ net
Manila, Hay Rope.....₩ ℔ 11½¢ net
Sisal.....⅝ inch and larger ₩ ℔ 9½¢ net
Sisal.....½ inch ₩ ℔ 10½¢ net
Sisal.....⅜ and 5-16 inch ₩ ℔ 10½¢ net
Sisal, Hay Rope.....₩ ℔ 9½¢ net
Sisal, Tarred Rope.....₩ ℔ 10½¢ net
Sisal, Medium Lath Yarn.....₩ ℔ 8½¢ net
Cotton Rope.....₩ ℔ 15 @ 18¢ net
Jute Rope.....₩ ℔ 7¢
Discount 1½% for cash in 10 days.

Rules.
Boxwood.....dis 80&10 @ 80&10&10 %
Ivory.....dis 50 @ 50&10 %

Sad Irons.
From 4 to 10, at factory.....₩ 100 ℔ $2.40 @ $2.55
Self-Heating.....₩ doz. $9.00 net
Self-Heating, Tailors'.....₩ doz. $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons.....dis 40@40&5 %
Enterprise Star irons, new list, July 20, 1882.....dis 40 %
Combined Fluter and Sad Iron...₩ doz. $15.00, dis 15 %
Fox Reversible, Self-Fluter.....₩ doz., $24.00 net
Chinese Laundry (N. E. Butt Co.).....8½¢, dis 15 %
New England.....5¢, dis 15 %
Mahony's Troy Pol. Irons.....dis 25 %
Sensible.....dis 20 @ 20&5 %

Sand and Emery Paper and Cloth.
List April 19, 1886.....dis 20@20&5 %
Sibley's Emery and Crocus Cloth.....dis 30 %

Sash Cord.
Common.....₩ ℔, 10¢ @ 11¢
Patent, good quality.....₩ ℔, 13¢ @ 13½¢
White Cotton Braided, fair quality.....₩ ℔ 28¢ @ 29¢
Common Russia Sash.....₩ ℔ 13½¢
Patent " " .....₩ ℔ 15¢
Cable Laid Italian " .....₩ ℔ 22¢ @ 23¢
India Cable Laid " .....₩ ℔ 13¢
Silver Lake, A Quality, White.....50¢, dis 10&10&5 %
Silver Lake, A Quality, Drab.....55¢, dis 10&10&5 %
Silver Lake, B Quality, White.....50¢, dis 20&10&5 %
Silver Lake, B Quality Drab.....50¢, dis 20&10&5 %
Silver Lake, C Quality White (only).....27¢ @ 28¢
Sylvan Spring, Extra Braided, White.....34¢
Sylvan Spring, Extra Braided, Drab.....30¢
Semper idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson, Braided, White Cotton....50¢ dis 30 @ 30&5 %
Samson, Braided, Drab Cotton....55¢ dis 30 @ 30&5 %
Samson, Braided Italian Hemp....55¢ dis 30 @ 30&5 %
Samson Braided Linen.....80¢ dis 30 @ 30&5

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ₩ gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Morris and Triumph, list Aug. 16, 1886.....dis 60&10 %
Victor.....60&10&2 %
Walker's.....dis 10 %
Attwell Mfg. Co.....dis 25 @ 33⅓ %
Reading.....dis 66⅔&10 @ 66⅔&10&10 %
Hammond's Window Springs.....dis 40 %
Common Sense, Jap d. Cop'd and Br'zed..₩ gross $1.10
Common Sense, Nickel Plated.....₩ gross $10.00
Universal.....dis 30 %
Kempshall's Gravity.....dis 60 %
Kempshall's Model.....dis 60@60&10 %
Corbin's Daisy, list February 15, 1886.....dis 70 %
Payson's Perfect.....dis 60 @ 60&10 %
Huguenin's New and Improved Adjustable Sash Balances, list Jan. 5, 1887.....dis 25&2&2 %
Huguenin's New Sash Locks, list Jan. 5, '87.dis 25&5&2 %
Stoddard "Practical".....dis 10 %
Ives Patent.....dis 60 %
Lesche's Nos. 100 & 110, ₩ gro, $8; 105, $10, dis 20&10 %
Davis, Bronze, Barnes Mfg. Co.....dis 50 %
Champion Safety, List March 1, 1888....dis 55&5&5 %
Security.....dis 70 %

Sash Weights.
Solid Eyes.....₩ ton. $22

Sausage Stuffers or Fillers.
Miles' "Challenge".....₩ doz. $20, dis 50&50&5 %
Perry.....₩ doz. No. 1, $15; No. 0, $21, dis 50&50&5 %
Draw Cut No. 4.....each, $30.00, dis 20 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Silver's.....dis 40&10 %

Saws.
Disston's Circular....dis 45@45&5 %
Disston's Cross Cuts..dis 45@45&5 %
Disston's Hand.....dis 25@25&5 %
} Extravagant some-times given by jobbers.
Atkins' Circular.....dis 50 %
Atkins' Silver Steel Diamond X Cuts.....₩ foot 70¢
Atkins' Special Steel Dexter X Cuts.....₩ foot 50¢
Atkins' Special Steel Diamond X Cuts.....₩ foot 30¢
Atkins' Champion and Electric Tooth X Cuts.....₩ foot 27 @ 28¢
Atkins' Hollow Back X Cuts.....₩ foot 18¢
Atkins' Shingle, Mulay, Drag, &c.....dis 45 %
W. M. & C., Hand.....dis 30&5 @ 30&10 %
W. M. & C. Champion X Cuts, Regular ₩ foot .24¢@26¢
W. M. & C. X Cuts, Thin Back.....₩ foot 27¢ @29¢
Peace Circular and Mill.....dis 45&10 %
Peace Hand Panel and Rip....dis 20&10 @ 20&10&10 %
Peace Cross Cuts, Standard.....₩ foot 25¢
Peace Cross Cuts, Thin Back.....₩ foot 27¢@28¢
Richardson's Circular and Mill.....dis 45 @ 45&10 %
Richardson's X-Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 24¢

Hack Saws—
Griffin's Hack Saws, complete.....dis 40&10 @ 50 %
Griffin's Hack Saw, Blades only.....dis 40&10 @ 50 %
Star Hack Saws and Blades.....dis 25 %
Diamond Hack Saws and Blades.....dis 25 %
Eureka and Crescent.....dis 25 %

Saw Frames.
White Vermont.....₩ gro $9 @ $10
Red, Polished, and Varnished....₩ doz $1.50, dis 25 %

Saw Sets.
Stillman's Genuine....₩ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imita..₩ doz $3.25 and $5.25, dis 40&5&40&10 %
Common Lever.....₩ doz $3.00, dis 40&5 %
Morrill's No. 1, $15.00; Nos. 3 & 4, $24....dis 40&10@50 %
Leach's.....No. 0, $8.00; No. 1, $15.00, dis 15 @ 20 %
Nash's.....dis 20&10 @ 20&10&10 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Semis & Call Co.'s new Patent....dis 30&5 %
Bem's & Call Co.'s Lever and Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00, dis 50&10 %
Aiken's Imitation.....$7.00, dis 50&5 %
Hart's Patent Lever.....dis 20 %
Disston's, Star, 79, No. 15, $5.50, dis 20&10@20&10&10 %
Atkins' Lever.....per doz No. 1, $6.00; No. 2, $9.00
Atkins' Criterion.....per doz $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.. dis 40 &10 %

Saw Tools.
Atkins Perfection.....$15.00; Excelsior $6.00 ₩ doz

Scales.
Hatch, Counter, No. 171, good quality.....₩ doz $21
Hatch, Tea, No. 161.....₩ doz $6.75 @ $7.00
Union Platform, Plain.....$2.10 @ $2.20
Union Platform, Striped.....$2.20 @ 2.30
Chatillon's Grocers' Trip Scales.....dis 25 %
Chatillon's Eureka.....dis 25 %
Chatillon's Favorite.....dis 40 %
Family, Turnbull's.....dis 30@30&10

Scale Beams.
Scale Beams List of Jan. 12, 82..dis 50&10@50&10&5 %
Chatillon's No. 1.....dis 40 %
Chatillon's No. 2.....dis 50 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.).$6.50, dis 30&10 %
Box, 1 Handle.....₩ doz $4.00, dis 10 %
Box, 2 Handle.....₩ doz $6.00, dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 50&10@60 %
Ship, Common.....₩ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

Screen Window and Door Frames.
Porter's Pat. Window and Door Frame...dis 33⅓&10 %
Screen Corner Irons, Warner's....dis 33⅓ @ 33⅓&10 %
Stearns' Frames and Corners.....dis 25 @ 25&10 %

Screw Drivers.
Douglas Mfg Co.....dis 20&10&10 %
Disston's.....dis 45&10 %
Disston's Patent Excelsior.....dis 45&10 %
Buck Bros.....dis 30 %
Stanley R. & L. Co.'s Varnished Handles....dis 55&10 %
Stanley R. & L. Co.'s Black Handles.....dis 60&10 %
Sargent & Co.'s No. 1 Forged Blade....dis 60&10&10 %
Sargent & Co.'s Nos. 20, 40 and 60.....dis 66⅔&10&10 %
Knapp & Cowles' No. 1.....dis 60&20 @ 70 %
Knapp & Cowles' No. 1 Extra.....dis 60 @ 60&10 %
Knapp & Cowles' No. 00 & 4.....dis 50&5 @ 50&10&5 %
Stearns'.....dis 25&10&10 %
Gay & Parsons.....dis 35 %
Champion.....dis 25&10 %
Clark's Patent.....dis 30 @ 33⅓ %
Crawford's Adjustable.....dis 30 %
Eilrich's Socket and Ratchet.....dis 25 @ 25&10 %
Allard's Spiral, new list.....dis 25 %
Kolb's Common Sense.....₩ doz $6, dis 25&10 %

Syracuse Screw-Driver Bits.....dis 30 & 30&5 %
Screw Driver Bits.....₩ doz. 50¢ @ 75¢
Screw Driver Bits, Parr's.....₩ gro 6.25
Fray's Hol. Hdle. Sets, No. 3, $12.....dis. 25 @ 25 & 10 %
P. D. & Co.'s, all Steel.....dis 50 %

Screws

Wood Screws—List, Brass, Jan 27; Iron, July 1, 1887

Flat Head Iron.....dis 70 %
Round Head Iron.....dis 65 %
Flat Head Brass.....dis 65 %
Round Head Brass.....dis 60 %
Flat Head Bronze.....dis 65 %
Round Head Bronze.....dis 60 %

} Ex. 10 % often given by jobbers.

Machine—
Flat Head, Iron.....dis 55 %
Round Head, Iron.....dis 50 %

Bench and Hand—
Bench, Iron.....dis 55&10 @ 55&10&10 %
Bench, Wood, Beech.....₩ dos $2.25
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 25&10 @ 25&10&5 %
Lag, Blunt Point.....dis 75 @ 75&10 %
Coach and Lag, Gimlet Point.....dis 75 %
Bed.....dis 25&5 %
Hand Rail, Sargent's.....dis 60&10&10 %
Hand Rail, Humason, Beckley & Co.'s..dis 70&10@75 %
Hand Rail, Am. Screw Co.....dis 75 %
Jack Screws, Millers Falls list.....dis 50 @ 50&5 %
Jack Screws, P. S. & W.....dis 35 %
Jack Screws, Sargent.....dis 60&10 @ 60&10&5 %
Jack Screws, Stearns'.....dis 40 @ 40&10 %

Scroll Saws.

Lester, complete, $10.00.....dis 25 %
Rogers, complete, $4.00.....dis 25 %

Scythe Snaths......dis 50&5 %

Shears.

American (Cast) Iron.....dis 75&10 @ 75&10&5 %
Pruning.....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....₩ dos $3.75
Tinners'.....dis 20&2 %
Seymour's, List, Dec. 1881 dis 60&10&10@60&10&10&5 %
Heinsch's, List, Dec. 1881..dis 60&10&10@60&10&10&5 %
Heinsch's Tailor's Shears.....dis 33⅓ %
First quality C. S. Trimmers.....dis 80@80&10 %
Second quality C. S. Trimmers..dis 80&10@80&10&10 %
Acme Cast Shears.....dis 10&10 %
Diamond Cast Shears.....dis 10 %
Clipper.....dis 10&10 %
Victor Cast Shears.....dis 75&10@75&10&5 %
Howe Bros. & Hulbert, Solid Forged Steel..dis 40 %
Cleveland Machine Co.. Solid Steel Forged.....dis 70 %
Clauss Shear Co., Japanned.....dis 70 %
Clauss Shear Co., Nickeled, same list.....dis 60 %

Sheaves.

Sliding Door—
M. W. & Co., list July, 1888.....dis 50&10 @ 60&5 %
R. & E., list Dec. 18, 1885.....dis 55&2 %
Corbin's list.....dis 60&10&2 %
Patent Roller.....dis 60&10&2 %
Patent Roller, Hatfield's.....dis 75 %
Russell's Anti-Friction, list Dec. 18, 1885..dis 60&2 %
Moore's Anti-Friction.....dis 60 %

Sliding Sautter—
R. & E. list Dec. 18, 1885.....dis 60&10&2 %
Sargent's list.....dis 60&10 %
Reading list.....dis 60&10&10 %

Ship Tools.

L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %

Shoes, Horse, Mule, &c.

Horse—
Burden's, Perkins', Phœnix, at factory.....$4.00

Mule—Add $1 ₩ keg to above prices.

Ox, Wrought—
Ton lots.....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

Shot.—*(Eastern prices, 2¢ off. cash, 5 days.)*

Drop, ₩ bag, 25 ℔.....$1.40
Drop, ₩ bag, 5 ℔.....33
Buck and Chilled, ₩ 25-℔ bag.....$1.65
Buck and Chilled, ₩ 5-℔ bag.....38

Shovels and Spades.

Ames' Shovels, Spades, &c., list Nov. 1, 1885.....dis 30 %

NOTE.—Jobbers frequently give 5 @ 7½ % extra on above.

Griffith's Black Iron.....dis 50&10 %
Griffith's C. S.....dis 60 @ 60&10 %
Griffith's Solid Cast Steel R. R. Goods.....dis 20 %
Old Colony (Sanford Fork & Tool Co).....dis 20 %
St. Louis Shovel Co.....dis 20 @ 20&7½ %
Hussey, Binns & Co.....dis 15 @ 25 %
Hubbard & Co.....dis 20@20&7½ %
Lehigh Mfg. Co.....dis 50&10 %
Layne Pettebone & Son, list January, 1886.....dis 30 %
Remington's (Lowman's Patent).....dis 30&10 @ 40 %
Rowland's, Black Iron.....dis 50&10 %
Rowland's Steel.....dis 60&5 @ 60&10 %

Shovels and Tongs.

Iron Head.....dis 60&10@60&10&5 %
Brass Head.....dis 60&10&10 %

Skeins, Thimble.

Western list.....dis 75&5 @ 75&10 %
Columbus Wrt. Steel, list Nov. 1, 1887.....dis 20 %
Coldwaterdale Iron Co.....dis 50&10 %
Utica P. S. T. Skeins.....dis 60 %
Utica Turned and Fitted.....dis 35 %

Sieves.

Buffalo Metallic, S. S. & Co., new list..dis 50&25&10 %
Barler Flour Sifters.....₩ doz $2.00
Smith's Adjustable Sifters.....₩ doz $2.25
Smith's Adjustable Milk Strainer.....₩ doz $2.00
Smith's Adjustable F. & C. Strainer.....₩ doz $1.75

Sieves, Wooden Rim—	Iron.	Plated.
Mesh 18, Nested. ₩ doz.	70¢	90¢
Mesh 20, Nested. ₩ doz.	85¢	$1.00
Mesh 24, Nested. ₩ doz.	$1.00	1.10

Silex.—School, by case.....dis 50&10 %

Snaps, Harness, &c.

Anchor (T. & S. Mfg Co.).....dis 55 %
Fitch's (Bristol).....dis 50&10 %
Hotchkiss.....dis 10 %
Andrews.....dis 50 %
Sargent's Patent Guarded.....dis 70&10&10 %
German, new list.....dis 40&10 %
Covert.....dis 50&2 %
Covert, New Patent.....dis 50&5&2 %
Covert New R. E.....dis 60&2 %
Covered Spring.....dis 60&10&10 %

Soldering Irons.

Covert's Adjustable. list Jan. 1, 1886.....dis 35&2 %

Spoke Shaves.—Iron.....dis 45 %
Wood.....dis 30 %
Bailey's (Stanley R. & L. Co.).....dis 40&10 %
Stearns'.....dis 20&10 @ 30 %

Spoke Trimmers.

Bonney's.....₩ dos $10.00, dis 50 %
Stearns'.....dis 20&10 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₩ doz., dis 55&10 %
Douglass'.....₩ dos $5.00, dis 30 %

Spoons and Forks.

Tinned Iron—
Basting, Central Stamping Co.'s list. dis 70@70&10 %
Solid Table and Tea, Central Stamping Company's list.....dis 70@70&10 %
Buffalo. S. S. & Co.....dis 35&2&2 %

Silver-Plated—4 mos. or 5 % cash 30 days.
Meriden Brit. Co., Rogers.....dis 50 %
C. Rogers & Bros.....dis 50 %
Rogers & Bro.....50 %
Reed & Barton.....dis 50 %
Wm. Rogers Mfg. Co.....dis 50&10 @ 50&10&5 %
Simpson, Hall, Miller & Co.....dis 50&10 %
Holmes & Edwards Silver Co..dis 50&10 @ 50&10&5 %
H. & E. Silver Co. Mexican Silver.....dis 50&5 %
H. & E. Silver Co., Durham Silver.....dis 50&5 %
German Silver.....dis 50 @ 50&5 %
German Silver, Hall & Elton.....dis 50&5 %, cash
Nickel Silver.....dis 50&5@50&10&5 %, cash
Britannia.....dis 60 %
Boardman's Flat Ware.....dis 50&10 %
Boardman's Nickel Silver.....dis 50 %
Boardman's Brit'nia Spoons, case lots.....dis 60 %

} 4 mo.

Springs.

Elliptic. Concord, Platform and Half Scroll.....dis 60 @ 60&5 %
Cliff's Bolster Springs.....dis 25 %

Squares.

Steel and Iron.....
Nickel-Plated.....dis 75 @ 80 %
Try Square and T Bevels.....dis 60&10&10 @ 70 %
Disston's Try Square and T Bevels.....dis 45&10 %
Winterbottom's Try and Miter.....dis 30&10 %

Staples.

Fence Staples, Galvanized } Same price as Barb Wire.
Fence Staples, Plain..... } See Trade Report.

Steelyards......dis 40&10@50 %

Stocks and Dies.

Blacksmith's, Waterford Goods.....dis 30&5 @ 30&10 %
Lightning Screw Plate.....dis 25 @ 30 %
Reece's New Screw Plates.....dis 33⅓ @ 33⅓&5 %

Stone.

Hindostan No. 1, 3¢; Axe, 5¾¢; Slips No. 1, 5¢..
Sand Stone.....₩ ℔, 2¢
Washita Stone, Extra.....₩ ℔, 2 1 @ 22¢
Washita Stone, No. 1.....₩ ℔, 15 @ 16¢
Washita Stone, No. 2.....₩ ℔, 11 @ 12¢
Washita Slips, No. 1, Extra.....₩ ℔, 40 @ 42¢
Washita Slips, No. 1.....₩ ℔, 30 @ 32¢
Arkansas Stone. No. 1, 4 to 6 in.....₩ ℔, $1.35
Arkansas Stone. No. 1, 6 to 9 in.....₩ ℔, $1.75
Turkey Oil Stone.....4 to 8 in..₩ ℔, 40¢
Turkey Slips.....₩ ℔, $1.00 @ $1.50
Lake Superior, Chase.....₩ ℔, 16¢
Lake Superior Slips, Chase.....₩ ℔, 31@32¢
Seneca Stone, Red Paper Brand, ₩ ℔.....18 @ 20¢
Seneca Stone, High Rounds, ₩ ℔.....20 @ 25¢
Seneca Stone, Small Whets, ₩ gro.....$24.00

Stove Polish.

Joseph Dixon's.....₩ gro $6.00, dis 10 %
Gem.....₩ gro $4.50, dis 10 %
Gold Medal.....₩ gro $6.00, dis 25 %
"Mirror".....₩ gro $6.00, dis — %
Lustro.....₩ gro $4.75 net
Ruby.....₩ gro $3.75 net
Rising Sun, 5 gro. lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ 8¢ net
Boynton's Noon Day, ₩ gro.....$5.00
Parlor Pride Stove Enamel.....₩ gross, $13
Yates' Liquid, 2 gal. $0.90, 3 $.80, 5 $.70, 10 gal. $.60 cans
Yates Standard Paste Polish ,10-lb cans, per lb., 15 ¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel.....₩ gro $19.00

Tacks, Brads, &c.
List Jan. 2, 1888.

American Iron Carpet Tacks.....dis 72½&10&2 %
Steel Carpet Tacks.....dis 72½&10&2 %
Swedes Iron Carpet Tacks.....dis 72½&10&2 %
American Iron Cut Tacks.....dis 70&10&2 %
Swedes Iron Tacks.....dis 67½&10&2 %
Swedes Iron Upholsterers' Tacks..dis 67½&10&2 %
Tinned Swedes Iron Tacks.....dis 67½&10&2 %
Tin'd Sw'des Iron Uphol'ers'Tacks.dis 67½&10&2 %
Gimp and Lace Tacks.....dis 67½&10&2 %
Tinned Gimp and Lace Tacks.....dis 67½&10&2 %
Swedes Iron Trimmers' Tacks.....dis 67½&10&2 %
Swedes Iron Miners' Tacks.....dis 67½&10&2 %
Swedes Iron Bill Posters' or Railroad Tacks.....dis 67½&10&2 %
Swedes Steel Tacks, all kinds (Swedes Iron price list).....dis 72½&10&2 %
Copper Tacks.....dis 33⅓&10&2 %
Copper Finishing Trunk and Clout Nails.....dis 33⅓&10&2 %
Finishing Nails.....dis 60&10&2 %
Trunk and Clout Nails.....dis 60&10&2 %
Tinned Trunk and Clout Nails.....dis 60&10&2 %
Basket Nails.....dis 60&10&2 %
Common and Patent Brads.....dis 60&10&2 %
Hungarian Nails.....dis60&10&2 %
Chair Nails.....dis 60&10&2 %
Zinc Glaizers' Points.....dis 40&10&2 %
Cigar Box Nails.....dis 45&10&2 %
Picture-Frame Points.....dis 45&10&2 %
Looking-Glass Tacks.....dis 45&10&2 %
Leathered Carpet Tacks.....dis 45&10&2 %
Brush Tacks.....dis 45&10&2 %
Shoe Finders'.....List Jan. 2, 1888, dis 10 @ 10&5 %
Lining and Saddle Nails, List Jan. 1, 1886:
Silvered.....dis 30&10&10 %
Japanned.....dis 20&10&10 %
Double-pointed Tacks.....85 %
Wire Carpet Nails.....dis 50&10 %
Wire Brads and Nails.....See Nails, Wire
Steel Wire Brads, R. & E. Mfg. Co.'s list.....dis 50&10 %

} Extra 1¢@10¢&5 % generally given.

Tap Borers.—Common and Rich.....dis 20&10 %
Ives' Tap Borers.....dis 33⅓&5 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Clark's.....dis 33⅓ @ 35 %

Tapes, Measuring.—American.....dis 25&10 %
Spring.....dis 40 %
Chesterman's.....Regular list dis 25 @ 30 %

Thermometers.—Tin Case.....dis 80 @ 80&10 %

Thimble Skeins.—See Skeins.

Ties, Bale.

Steel Wire, Standard list.....dis 50&10&5 %

Tinners' Shears, &c.

Shears and Snips (P. S. & W.).....dis 20 @ 25 %
Punches.—See Punches.
Snips, J. Mallinson & Co.....dis 33⅓ %

Tinware.

Stamped, Japanned & Pieced, list Jan. 20, 18..
.....dis 70&10 @ 70&10&5 %

Tire Benders, Upsetters, &c.

Stoddard's Lightning Tire Upsetters.....dis 15 %
Detroit Perfected Tire Bender.....dis 15 %

Tobacco Cutters.

Enterprise Mfg. Co. (Champion).....dis 20&10 @ 30 %
Wood Bottom.....₩ dos $5.00 @ $5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s.....₩ dos $18.00, dis 50 @ 55 %
Wilson's.....dis 55 %
Sargent's.....₩ dos $24, dis 55&10 %
Acme.....₩ dos $20.00, dis 40 %

Transom Lifters

Wollensak's Patent Iron Bronzed.....dis 50 %
Reiber's Bronzed Iron Rods list Jan. 1, 1887.dis 50&2 %
Reiber's Real Bronze or Nickel Plate. list Jan. 1, 1887.....dis 50&2 %
Excelsior.....dis 50&10&2 %
Shaw's.....dis 50&10 %
Payson's Universal.....dis 40 @ 40&10 %
Crown and Star.....dis 50 %

Traps.

Game—
Newhouse.....dis 35 @ 40&5 %
Oneida, Pattern.....dis 70 @ 70&5 %
Game, Blake's Patent.....dis 40&10&5 %

Mouse and Rat—
Mouse, Wood. Choker.....₩ dos holes. 11@12¢
Mouse, Round Wire.....₩ dos $1.50, dis 10 %
Mouse, Cage, Wire.....₩ dos $2.50, dis 10 %
Mouse, Catch-'em-alive.....₩ dos $2.50, dis 15 %
Mouse, "Bonanza".....₩ gross $10 net
Mouse, Delusion.....₩ gross $18.00, dis 15 %
Rat, "Decoy".....₩ gross $10.00, dis 10 %
Ideal.....₩ gross $10
Cyclone.....₩ gross $5.25
Hotchkiss Metallic Mouse, 5-hole traps.....₩ doz 90¢
In full cases.....₩ doz 75¢

Trowels.

Lothrop's Brick and Plastering.....dis 25 %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 25 @ 25&10 %
Peace's Plastering.....dis 25 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 @ 20 %
Brade's Brick.....dis 25 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 70 %

Triers.—Butter and Cheese.....dis 25 %

Trucks, Warehouse, &c.

B. & L. Block Co.'s list, 1882.....dis 40 %

Tubes, Boiler.—See Pipe

Twine.

	BC.	R.
No. 9, Flax Twine, ¼ and ⅛ ℔ Balls	22¢	30¢
No. 12, " " ¼ and ½ "	21¢	29¢
No. 18, " " ¼ and ½ "	18¢	28¢
No. 24, " " ¼ and ½ "	18¢	28¢
No. 36, " " ¼ and ½ "	16¢	27¢
No. 264, Mattrass, ¼ and ½ "	43 @ 50¢	
Chalk Line, Cotton, ½ ℔ Balls		25¢
Mason Line, Linen, ½ "		55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)		11½¢
3-Ply Hemp, 1 ℔ Balls		12 @ 12½¢
3-Ply Hemp, 1½ ℔ Balls		11 @ 11½¢
Cotton Wrapping, 5 Balls to ℔		15¢ @ 16¢
2, 3, 4 and 5 Ply Jute, ½ ℔ Balls		10¢
Wool		6½¢ @ 6¾¢
Paper	13¢ @ 14¢	
Cotton Mops—6, 9, 12 and 15 ℔ to doz.		18¢

Vises.

Solid Box.....dis 60 @ 60&5 %

Parallel—
Fisher & Norris Double Screw.....dis 15&10 %
Stephens'.....dis 25 @ 30 %
Parker's.....dis 20 @ 25 %
Wilson's.....dis 55 %
Howard's.....dis 40 %
Bonney's.....dis 40&10 %
Millers Falls.....dis 40 @ 40&2.0 %
Trenton.....dis 40&5 @ 40&10 %
Merrill's.....dis 15@20 %
Sargent's.....dis 60&10&10 %
Backus and Union.....dis 40 %
Double Screw Leg.....dis 15&10 %
Prentiss.....dis 20&5 @ 25 %
Simpson's Adjustable.....dis 40 %

Saw Filers—
Bonney's. Nos. 2 & 3.....₩ doz $15.00, dis 4 &10 %
Stearn's.....dis 33⅓&10 @ 33⅓&10&10 %
Stearn's Silent Saw Vises.....dis 33⅓ @ 35 %
Sargent's.....dis 66⅔&10 %
Hopkins'.....₩ doz $17.50 dis 10 %
Reading.....dis 40&10 %
Wentworth.....dis 20&10 %
Combination Hand Vise.....₩ gro, $42.00
Cowell Hand Vises.....dis 20 %
Bauer's Pipe Vises.....dis 10 %

Wagon Boxes.

Per lb.....3½¢

Wagon Jacks.

Daisy.....₩ doz $4.00, dis 25 %

Washer Cutters.

Smith's Patent.....₩ dos $12.00, dis 40&10&10 %
Johnson's.....₩ dos $11.00, dis 33⅓ %
Penny's.....₩ dos Pol. $14; Jap'd, $16..dis 55 %
Appleton's.....₩ dos $16.00, dis 60&10 %
Bonney's.....dis 30&10 %

Washers.

Size	¼	5-16	⅜	7/16	½	⅝	¾	1
Washers	7	5⅜	4¼	3⅜	2¾	2¼	1¾	1¼

In lots less than 200 ℔, ₩ ℔, add ½¢, 5-℔ boxes 1¢ to list

Wedges.—Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 4 ¢

Well Buckets, Galvanized.

Bill's.....₩ doz., 12 qt., $4.25; 14 qt., $5.25
Iron Clad.....₩ doz., 14 qt., $4.25 @ $4.50
Whiting's Flat Iron Band.....₩ doz $4.25 @ $4.50
Whiting's Wired Top.....₩ doz $4.00 @ $4.25

Well Wheels—8 in., $2.25; 10 in., $2.70; 12 in., $3.25.

Wire.

Iron—
Market. Br. & Ann., Nos. 0 to 18.....dis 75@75&5 %
Market, Coppered, Nos. 0 to 18.....dis 70@70&10 %
Market, Galvanized, Nos. 0 to 18.....dis 65&10 %
Market. Tin'd. Tinned list Nos. 0 to 18.....dis 67½@67½&5 %
Stone Br. & Ann'd, Nos. 16 to 18.....dis 72½&10&5@75 %
Stone, Bright & Ann'd, Nos. 19 to 26..dis 75&5@75&10 %
Stone. Br. & Ann'd, Nos. 27 to 36...dis 75&10&5@80 %
Stone, Tin'd. Tin'd list, Nos. 18 to 36..dis 70@10@75 %
Tinned Broom Wire, Nos. 18 to 24.....dis 72½@75 %
Galvanized Fence.....dis 65@65&5 %
Annealed Fence, Nos. 8 & 9.....dis 72@75&5 %
Annealed Grape, Nos. 10 to 14.....dis 75@75&5 %
Brass, list, Jan. 18, '84.....dis 15 @ 20 %
Copper, list Jan. 18, 1884.....dis 20 @ 25 %
Barb Fence.....See Trade Report
Wire on Spools.....dis 65 %
Malin's Steel and Tinned Wire on Spools.....dis 40 %
Malin's Brass and Copper Wire on Spools.....dis 30 %
Cast Steel Wire.....dis 50 %
Stubs' Steel Wire.....$6.00 to 8, dis 20 %
Steel Music Wire, Nos. 12 to 30.....55¢ ₩ ℔
Picture Wire.....dis 60&10 %
Barb Wire Safety Guards.....₩ 1000 $9.00, dis 25 %
Wire Clothes Lines. See Lines.

Wire Cloth, Netting, &c.

Painted Screen Cloth, No. 24, ₩ 100 sq ft.....$1.90
Painted Screen Cloth, No 33, ₩ 100 sq. ft.....$2.00
Galvanized Wire Netting.....dis 70&10 @ 75 %

Wire Goods.—See Bright Wire Goods.

Wire Rope.—List May 1, 1886.....dis 33⅓ %

Wrenches.—American Adjustable.....dis 40 %
Baxter's Adjustable "S".....dis 40&10 @ 50 %
Baxter's Diagonal.....dis 40&10 @ 50 %
Coes' Genuine.....dis 55&2 %
Coes' "Mechanics'".....dis 55&10&2 %
Girard Standard.....dis 70&10 %
Lamson & Sessions' Engineers'.....dis 60&10 %
Lamson & Sessions' Standard.....dis 70&10 %
Coes' Pattern, Wrought.. }
Girard Agricultural.... } ..dis 80 @ 80&5 %
Lamson & Sessions' Agricultural... }
Sterling Wrought.....
Bemis & Call's Patent Combination.....dis 35 %
Bemis & Call's Merrick's Pattern.....dis 35 %
Bemis & Call's Brigg's Patt'n.....dis 25 %
Bemis & Call's Cylinder or Gas Pipe.....dis 40&5 %
Bemis & Call's No. 3 Pipe.....dis 35&5 %
Aiken's Pocket (Bright).....$6.00, dis 50&10 %
The Favorite Pocket (Bright).....₩ doz $4.00. dis 40 %
Webster's Patent Combination.....dis 25 %
Boardman's.....dis 2& 10 %
Always Ready.....dis 25&5 %
Alligator.....dis 50 %
Donohue's Engineer.....dis 10&10 %
Acme, Bright.....dis 60&3 %
Acme, Nickeled.....dis 50&3%
Walker's.....dis 55&3 %
Diamond.....dis 40 %
Diamond Patent Steel.....dis 40 %

Wringers, Clothes.

List Jan. 10 1888, $2.50 off.

Wrought Goods.

Staples Hooks, &c., is Jan. 12, '87.dis 30&20@50&20

CURRENT METAL PRICES.

SEPTEMBER 12, 1888.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:
¾ to 2 in. round and square.. } ₩ lb 1.90 @ 2.00¢
1 to 6 in. x ½ to 1 in..... }
Refined Iron:
¾ to 2 in. round and square.. }
1 to 4 in. x ½ to 1¼ in..... } ₩ lb 2.10 @ 2.2¢
4½ to 6 in. x ½ to 1 in..... }
1 to 6 in. x ¼ and 5-16 ..... ₩ lb 2.30 @ 2.4¢
Rods—⅝ and 11-16 round and sq.. ₩ lb 2.20 @ 2.3¢
Bands—1 to 6 x 3-16 to No. 12..... ₩ lb 2.30 @ 2.4¢
"Burden Best" Iron, base price.. ₩ lb 3.00 @ ... ¢
Burden's "H. B. & S." Iron, base price..... ₩ lb 2.80 @ ....¢
"Ulster"..... lb lb 3.10 @ ....¢
Norway Rods ..... 4.00 @ 5.00¢

Merchant Steel from Store.

Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots..... 2½¢ @ 3¢
Best Cast Steel, base price in small lots 8¾¢ @ 9¢
Best Cast Steel Machinery, base price in small lots ..... 5½¢ @ 6¢

For Classification and Extras adopted by the Merchant Steel Association of the United States, June 1, 1888, see *The Iron Age*, June 21, 1888.

Sheet Iron from Store.

	Common American.	R. G. Cleaned.
10 to 16	₩ lb 2.75 @ 2.80¢	3.25 @ ....¢
17 to 20	₩ lb 2.85 @ 3.00¢	3.25 @ 3.50 ¢
21 to 24	₩ lb 3.00 @ 3.10¢	3.50 @ ....¢
25 and 26	₩ lb 3.20 @	3.50 @ ....¢
27	₩ lb 3.35 @ 3.37½¢	3.75 @ ....¢
28	₩ lb 3.50 @ ....¢	4.00 @ ....¢
	B. B.	2d qual.
Galv'd, 14 to 20	₩ lb. 4.50 @	4 38 @ ....¢
Galv'd, 21 to 24	₩ lb, 4.87½ @	4.75 @ ....¢
Galv'd, 25 to 26	₩ lb, 5 25 @	5.12 @ ....¢
Galv'd, 27	₩ lb, 5.62½ @	5.48 @ ....¢
Galv'd, 28	₩ lb, 6 00 @	5.85 @ ....¢
Patent Planished	₩ lb A 10¢	B, 9¢
Russia	₩ lb 9½¢ @ 10¢	
American Cold Rolled B. B	₩ lb 5¢ @ 7¢	

English Steel from Store.

Best Cast ..... ₩ lb 15 ¢
Extra Cast ..... ₩ lb 16½ @ 17 ¢
Swaged, Cast ..... ₩ lb 16 ¢
Best Double Shear ..... ₩ lb 15 ¢
Blister, 1st quality ..... ₩ lb 12½¢
German Steel, Best ..... ₩ lb 10 ¢
2d quality ..... ₩ lb 9 ¢
3d quality ..... ₩ lb 8 ¢
Sheet Cast Steel, 1st quality ..... ₩ lb 15 ¢
2d quality ..... ₩ lb 14 ¢
3d quality ..... ₩ lb 12½¢

METALS.

Tin.

	Per lb
Banca, Pigs	25¢
Straits, Pigs	25¢
English, Pigs	24¢
Straits in Bars	26¢

Tin Plates.

Charcoal Plates.—Bright.

		Per box.
Melyn Grade	IC 10 x 14	$5.75 @ $6 00
" "	IC, 12 x 18	6.00 @ 6.25
" "	IC, 14 x 20	5.75 @ 6.00
" "	IC, 20 x 28	12.25 @ 12.50
" "	IX. 10 x 14	7.25 @ 7.50
" "	IX, 12 x 12	7.50 @ 7 75
" "	IX, 14 x 20	7 25 @ 7.50
" "	IX, 20 x 28	15.25 @ 15 50
" "	DC, 12½ x 17	5.50 @ 5 75
" "	DX, 12½ x 17	7.00 @ 7 25
Calland Grade	IC, 10 x 14	$6.00
" "	IC, 12 x 12	6 25
" "	IC, 14 x 20	6.00
" "	IX, 10 x 14	7.50
" "	IX, 12 x 12	7.75
" "	IX, 14 x 20	7.50
Allaway Grade	IC, 10 x 14	$5.25 @ ....
" "	IC, 12 x 12	5.50 @ ....
" "	IC, 14 x 20	5.25 @ ....
" "	IC, 20 x 28	10.75 @ ....
" "	IX, 10 x 14	6.25 @ ....
" "	IX, 12 x 12	6 50 @ ....
" "	IX, 14 x 20	6.25 @ ....
" "	IX, 20 x 28	12.50
" "	DC, 12½ x 17	5.00 @ ....
" "	DX, 12½ x 17	6.00 @ ....

Coke Plates—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20		$5.00 @ ....
	10 x 20	7.50 @ 7.65
	20 x 28	10.25 @ ....
	IX, 10 x 14, 14 x 20	5.75
BV Grade.—IC, 10 x 14, 14 x 20		4.70 @ ....

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20		$4.62½ @ ....
	20 x 28	9 25 @ ....
	IX, 14 x 20	5.62½ @ ....
	20 x 28	11.37½ @ ....
Abecarne Grade.—IC, 14 x 20		4.50 @ ....
	20 x 28	9.00 @ ....
	IX, 14 x 20	5.50 @ ....
	20 x 28	10.80

Tin Boiler Plates.

IXX, 14 x 26	112 sheets	$12.50 @ $12.75
IXX, 14 x 28	112 sheets	12 75 @
IXX, 14 x 31	112 sheets	14.25 @

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

Ingot.

Lake	@ 18¢
"Anchor" Brand	@ 17.50¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		25	25	25	26	27	28	31	33
30	72		25	25	25	26	28	30	34	....
36	96		25	25	25	27	29	33	36	....
36	96		25	25	26	28	30	34	38	....
48	96		25	25	27	29	31	35	....	....
48	96		25	25	28	30	32	36	....	....
60	96		25	25	30	32	37	....	....	....
60	96		25	26	31	....	....	....	....	....
84	96		26	27	..	....	....	....	....	....
84	96		27	28	....	....	....	....	....	....
Over 84 in. wide			28	30	....	....	....	....	....	....

	16 oz.	14 oz.	12 oz.	10 oz.
All Bath Tub Sheets				
Per pound	$0.28	0.30	0.32	0 35

Bolt Copper, ⅝ inch diameter and over, per pound ..... 25¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles over 60 inches diameter, up to 96 inches diameter inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

Per pound.
14 ounce to square foot and heavier ..... 28¢
12 ounce and up to 14 ounce to square foot ..... 29¢
10 ounce and up to 12 ounce ..... 31¢
Circles less than 8 inches diameter 2 cents per pound additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each ..... 8¢
Tinning sheets on one side, 30 x 60 each ..... 30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each ..... 15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each ..... 12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each ..... 12¢
Tinning sheets on one side, other sizes, per square foot ..... 2½¢
For tinning both sides double the above prices.

Planished Copper.

Planished Copper List May 5, 1888 ..... Net

Brass and Copper Tubes.

Seamless Copper.		Seamless Brass.	
⅜ inch ₩ lb	50¢	⅜ inch ₩ lb	47¢
½ " "	44¢	½ " "	41¢
⅝ " "	42¢	⅝ " "	39¢
¾ " "	40¢	¾ " "	37¢
⅞ " "	39¢	⅞ " "	36¢
1 " "	37¢	1 " "	34¢
1½ " "	34¢	1½ " "	31¢

Roll and Sheet Brass.

Discount from list ..... 10 @ 15 %

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.
Western Spelter ..... 5¼¢
"Bergenport" ..... 8¾¢
"Bertha" ..... 7¾ @ 8¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.
600 lb casks ..... 6½¢
Per lb ..... 7¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.
American ..... 5½¢
Newark ..... 5½¢
Bar ..... 6¢
Pipe, subject to trade discount ..... 7½¢
Tin-Lined Pipe, subject to trade discount ..... 15¢
Block Tin Pipes subject to trade discount ..... 45¢
Sheet, subject to trade discount ..... 8¢

Solder.

½ @ ½ (Guaranteed) ..... 15¢
Extra Wiping ..... 13¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson ..... ₩ lb 13¾ @ 14¢
Hallett's ..... " 11¾¢

Plumbers' Brass Work.

	Discount per cent.
Ground Bibbs and Stops	55&10&2
Ground Stops, Hydrant Cocks, &c	55&10&2
Corporation Cocks	55&10&2
Corporation Cocks, "Mueller" Pattern, from Western list	55&10&2
Ground Basin and Shampooing Cocks	50&10&2
Compression Basin Cocks	50&10&2
Compression Basin and Sink Cocks	50&10&2
Compression Pantry Cocks	50&10&2
Compression Double Basin and Shampooing Cocks	50&10&2
Compression Double Bath Cocks	50&10&2
Compression Bibbs, Urinal Cocks, Sill Cocks, Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks	50&10&2
Basin Plugs and Basin Grates	55&10&2
Bath and Wash Tray Plugs	55&10&2
Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Cistern Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets	55&10&2
Basin Clamps, Basin Joints and Strainers	55&10&2
Boiler Couplings, Ground Face, per set $1.25	dis 10
Boiler Couplings, Plain Face, per set $1.20	dis 10
Water Back Valve and Plain Couplings, Soldering Nipples and Unions	55&10&2
Union Joints	60&10&2
Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides	55&10&2
Hose Goods	55&10&2

Steam and Gas Fitters' Brass and Iron Work.

	Discount per cent.
Brass Globe Valves	60&10&2
Finished Brass Globe Valves, with Finished Brass Wheels	40&10&2
Brass Globe Valves, with Patent Wood Wheels	60&10&2
Brass Globe Angle and Corner Valves	60&10&2
Brass Radiator Angle Valves	60&10&2
Brass Radiator Angle Valves, Frink's Patent	60&10&2
Brass Cross and Check Valves	60&10&2
Brass Check Valves	60&10&2
Brass Hose Valves	60&10&2
Brass and Iron Frink Valves	60&10&2
Brass Safety Valves	60&10&2
Brass Vacuum Valves	50&10&2
Brass Whistle Valves	60&10&2
Brass Balance, Back Pressure and Foot Valves	50&10&2
Brass Butterfly and Throttle Valves	50&10&2
Brass Pump Valves	50&10&2
Brass Steam Cocks	57½&10&2
Brass Service, Meter and Union Meter Cocks	57½&10&2
Brass Whistles, Water Gauges and Oil Cups	60&10&2
Brass Hollow Plug, Tallow and Globe Oil Cups	50&10&2
Brass Lubricators	60&10&2
Brass Air Valves	60&10&2
Brass Air Cocks	60&10&2
Brass Gauge Cocks	55&10&2
Brass Cylinder Cocks and Steam Bibbs	50&10&2
Brass Swing Joints and Expansion Joints	50&10&2
Brass Test Pumps	50&10&2
Brass Steam Fittings, Rough	60&10&2
Brass Steam Fittings, Finished	2 &10&2
Brass Union Joints	60&10&2
Brass Soldering Unions and Nipples	55&10&2
Brass Hose Fittings, Fusible and Boiler Plugs	55&10&2
Iron Body Globe, Angle, Cross and Check Valves	65&10&2
Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves	65&10&2
Iron Cocks, all Iron	65&10&2
All Iron Valves	65&10&2

Miscellaneous.

	Discount per cent.
Cast Iron Fittings	70&10
Plugs and Bushings	75&10
Malleable Iron Unions	67½
Malleable Iron Fittings	25

Paints.

Black, Lamp—Coach Painters'	₩ lb 22 @ 24¢
" Ordinary	6¢
Black, Ivory Drop, fair	12 @ 15¢
" " best	25¢
Black Paint, in oil....kegs, 8¢; assorted cans, 11¢	
Blue, Prussian, fair to best	40 @ 55¢
" " in oil	45 @ 55¢
" Chinese dry	70¢
" Ultramarine	18 @ 30¢
Brown, Spanish	1¼¢
" Van Dyke	10 @ 12¢
Dryers, Patent American...ass'd cans, 9¢; kegs, 7¢	
Green, Chrome	15 @ 25¢
Green, Chrome in oil	14 @ 18 @ 25¢
Green, Paris	good, 20¢; best, 25¢
Green, Paris in oil	good, 30¢; best, 35¢
Iron Paint, Bright Red	₩ lb 2½¢
Iron Paint, Brown	₩ lb 1½¢
Iron Paint, Purple	₩ lb 3¢
Iron Paint, Ground in oil, Bright Red	₩ lb 6½¢
Iron Paint, Ground in oil, Red	₩ lb 5½¢
Iron Paint, Ground in oil, Brown	₩ lb 5½¢
Iron Paint, Ground, Purple	₩ lb 6¢
Litharge	6½¢
Mineral Paints	2 @ 4¢
Orange Mineral	10¢
Red Lead, American	6½¢
Red Venetian (Eng.) dry	$1.65 @ $1.70
Red Venetian in oil....ass't'd cans, 11¢; kegs, 8¢	
Red Indian Dry	9 @ 12¢
Rose Pink	10 @